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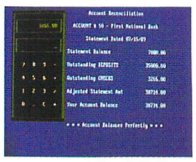

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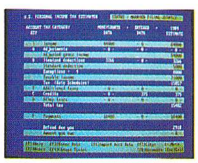

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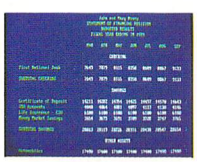

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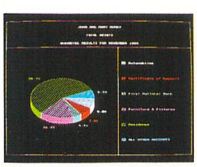

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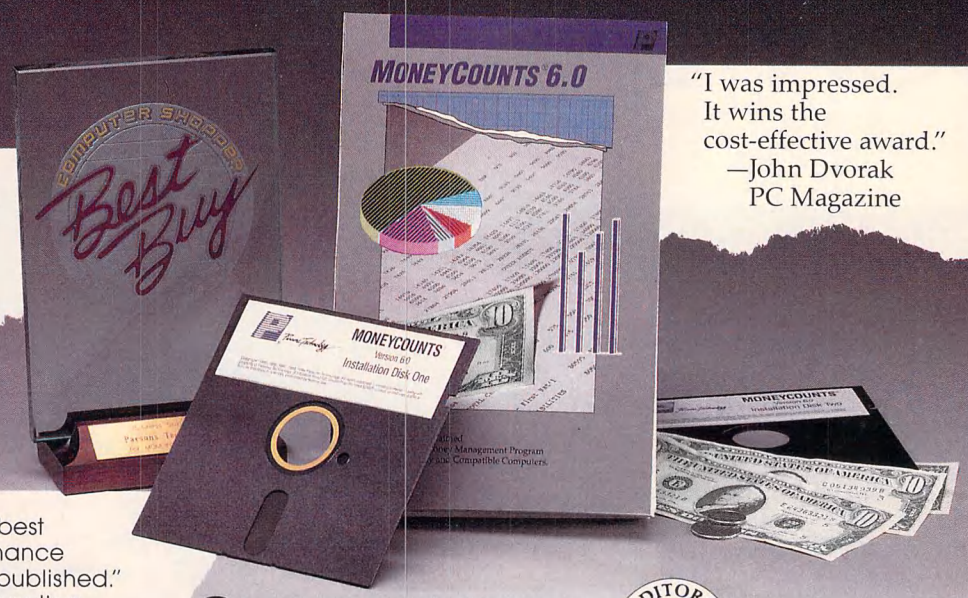

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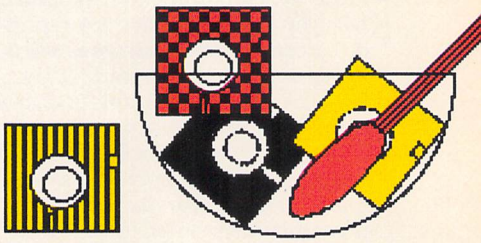

9 **Beautiful batch files.**

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THE EDITOR'S VIEW

Stand up and be counted! By filling out the readership survey found in this issue's magazine, you can tell us exactly what you think about *COMPUTE!'s PC Magazine* and its companion disk.

These surveys are important. They provide us with one of our best sources of information about you—the kind of equipment you have, what you like about the magazine, and what you don't like. This data is crucial in helping us tailor each issue of *COMPUTE!'s PC* to your wants and needs.

To show just how significant this information is, let's hit a few of the high spots from our January 1989 survey and see the impact of the results on the magazine and disk you hold in your hands.

The first question we look at on each survey is the one that details your PC's video hardware. In the past, responses have shown a strong mix of equipment, and the latest results were no exception.

EGA and VGA ownership has grown from about 15 percent in 1988 to more than 25 percent in 1989, but CGA is still in the lead with just over 60 percent. And a full 30 percent of you are using tried-and-true monochrome display adapters.

This mix of video systems has affected our magazine and disk in several ways. First, because the majority of you have CGA equipment, we're dedicated to providing CGA-compatible software on our disk. But the high number of EGA/VGA and monochrome users has led us to look for programs that support these modes as well.

But our main concern has been for readers with monochrome graphics systems. Since EGA and VGA are both downwardly compatible with CGA, those of you with Hercules-compatible graphics cards have been the only ones really left out of CGA-specific programs.

We searched long and hard for a solution that would allow monochrome graphics owners to run CGA programs, and we recently found one. *CGA*, a first-rate CGA simulator, published on last issue's disk, was such a success that we've decided to include it on *every* disk that contains a CGA-only program.

For example, on this disk you'll find *Word Processing for Kids*, a CGA-graphics text editor designed especially for children, and *Lumpies of Lotis IV*, a CGA maze game that takes cunning and skill to master. You'll also find the *CGA* program and its documentation. Monochrome graphics users need never be left out again.

Sometimes it's difficult to see trends based on readership survey info, but when it comes to hard drives, the message is clear. In 1988, we learned that 25 percent of you had hard drives. Our 1989 survey showed a whopping 63 percent. Because hard drives are becoming so popular, we've begun to include more programs that make them fast and easy to use.

QDups, found on this issue's disk, is just the kind of hard disk program we look for. It's an expertly designed utility that makes it a snap to keep your hard drive free of duplicate files. And best of all, *QDups* works well on floppy-based systems, too.

Hard drives aren't the only peripherals gaining in popularity. The number of you with mice has been growing by leaps and bounds, from a small 10 percent in 1988 to more than 34 percent in 1989. And, if there's one thing you can say about mouse users, it's that they go out of their way to find software that supports the device.

As a result, we're going out of our way to look for programs that, in addition to providing intuitive keyboard control, offer mouse operation, too. *DOS Help*, an instant, online MS-DOS command reference, found on this issue's disk, delivers lightning-fast keyboard access as well as smooth, surefooted mouse support.

Hard drives and mice are definitely hitting home, but there's another peripheral gaining ground every year. Our latest survey showed that the number of readers with modems has grown from about 20 percent in 1988 to nearly 50 percent in 1989. When George Campbell, our "Best of the Boards" columnist, heard that nearly half of you have modems, he almost jumped for joy. But his next words were, "I'll bet a lot of these readers are new to telecommunications. What can we do to make it easy for them to get started?"

He answered his own question with "Online Power: How to Get Started with Telecommunications." In this feature, George offers sage advice for those new to online life and those considering taking the plunge. If you're interested in this exciting world of hot tips, free software, and fascinating people, don't miss it.

As you can see, your responses to our readership surveys do make a difference. So, tell us a little about yourself and what you think of *COMPUTE!'s PC Magazine* by completing this issue's survey and mailing it in. Talk to us! We're listening.

Clifton Karnes
Editor

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Do you have a question about hardware or software? Or have you discovered something that could help other PC users? If so, we want to hear from you. Write to PC Feedback, COMPUTE!'s PC Magazine, *P.O. Box 5406, Greensboro, North Carolina 27403. We regret that we cannot provide personal replies to technical questions.*

Editor's note: Unsigned letters in this column are compilations of reader inquiries.

PC Text Editor

I have a Tandy 1000 EX. I've been using EDLIN to write batch files and FORTRAN programs. The problem is that EDLIN isn't a full-screen editor, and it's hard to use. I've tried using a word processor to write programs, but that also takes a lot of time. Is there a faster, easier way to write batch files and programs?

Nhut Ho
Komewood, IL

Yes, there's a better way to write batch files and programs. What you need is a good text editor. The capabilities of text editors lie between those of a bare-bones, line-oriented editor like EDLIN and those of a powerful word processor.

Like word processors, most modern text editors permit full-screen editing, perform search-and-replace operations, move blocks of text, and so on. Unlike word processors, text editors are limited to the commands needed to edit programs. For example, they can't typeset text, make footnotes or headers, or perform elaborate file handling.

Text editors are usually designed to be faster than word processors. They can usually load or save a file, delete a line, exit to DOS, or perform any other task with just a few keypresses. And because they perform fewer tasks, they're often smaller and take less time to load.

Another advantage of text editors is that they don't add extra control codes to the text as word processors do. These codes are used to set margins, specify typefaces, and so on. Compilers (such as your FORTRAN compiler) may send an error message when they encounter control codes in the text. The output of text editors is usually pure ASCII text, without any hidden control codes.

Finding a good text editor is easy. You can use SLED, *which was published on our January 1989 PC disk. There are several good text editors in the public domain, and there are good shareware and commercial ones as well. The most popular public domain editor is* MicroEMACS. *Some noteworthy shareware editors are* Qedit, BlueBeard, *and* E88. *Inexpensive commercial products include* The Norton Editor *(Peter Norton Computing),* Jou Labs Editing Tools *(Jou Labs), and* Out of the Blue *(Electronic Arts).*

You should be able to download a copy of a public domain or shareware editor from a bulletin board or find one in your user group's library. The commercial products can be purchased from most dealers.

Finding Files

I recently added a hard drive to my PC. This was a very welcome addition to my computer system since it provides instant access to my word processor, telecommunications program, compilers, and so forth. The only problem is that with all these files, I have trouble finding the exact file I'm looking for.

In the past, hard drives were expensive peripherals that few people could afford. Fortunately, the price of hard drives has steadily declined ever since IBM introduced the PC. Thanks to their new affordability, hard drives are rapidly becoming a vital component of every computer system.

One of the most important lessons to be learned by new hard drive owners is how to organize a hard drive. Users of floppy disk–based PCs usually organize their files by disks; for example, a word processor may be on one disk, a compiler on another, and a telecommunications program on still another.

With a hard drive, all of these files go onto one disk. A small (by today's standards), 20-megabyte hard drive can hold thousands of files. If you're not careful, your files will be lost in the shuffle.

When you first started school, all your papers could fit easily into your desk. As you grew older, your stack of papers grew. Today, you may have several cubic feet of papers to organize. If your level of organization has kept pace with your paperwork, you probably use filing cabinets and files rather than keeping all your papers in one big pile.

Disk drives are like filing cabinets. Some have a single drawer, while others have many. Subdirectories *are the disk equivalent of the drawers within a filing cabinet. Subdirectories let you organize your programs, support tools, and files for maximum safety, simplicity, and ease of use.*

Every disk automatically contains one directory, called the root directory. *The format command creates this directory as part of the formatting process. Subdirectories are created using the MD command. For example, the command to create a subdirectory called LETTERS is MD LETTERS. Type CD LETTERS to make the newly created subdirectory the default directory. Type CD .. to move to the next higher directory, or CD \ to move back up to the root directory.*

An interesting point about subdirectories is that they can contain other subdirectories, which can contain other subdirectories, and so on. With all these subdirectories, it's easy to forget which directory is the default. Luckily, DOS provides a simple solution to this problem: the prompt command. If you put the command PROMPT PG in your AUTOEXEC .BAT file, DOS always displays the pathname as part of your prompt. For ex-

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ample, if your default directory is called MEMOS and is in a directory called WORDSTAR on your hard drive, the prompt will be C:\WORDSTAR\MEMOS>.

Now that you understand subdirectories, you're ready to organize your hard drive. Instead of putting all your files in the root directory, you should put them in subdirectories. Turbo Pascal might go in a directory called TPASCAL, QuickC into a subdirectory called QUICKC, DOS commands into a subdirectory called DOS, and so on. (Use the PATH command to add this directory to the computer's search path; then add the command PATH=C:\;C:\DOS to your AUTOEXEC .BAT file.) The files COMMAND .COM, CONFIG.SYS, and AUTOEXEC .BAT should remain in the root directory; don't move them to a subdirectory.

With this method of organization, files are much easier to find. When you're looking for a Pascal program, you no longer need to search through C programs, and vice versa. Even so, you may have trouble finding a file from time to time. If you do, type in the following batch program and save it as WHEREIS.BAT:

```
ECHO OFF
CHKDSK /V > ALL.TXT
FIND "%1" ALL.TXT
DEL ALL.TXT
```

After you've saved the file, type WHEREIS FILENAME, where FILENAME is the name of the file you're looking for (FILENAME must be typed in uppercase letters for the program to work correctly). Every file that matches that name is displayed on the screen, along with its complete pathname.

This program is fairly short, but it illustrates the power of batch files. The first line is for cosmetic purposes only; it turns echo off. (DOS 3.3 users can substitute the command @ECHO OFF for an even cleaner-looking display.) The next line may seem strange to you. The CHKDSK command normally analyzes a disk and reports any errors it finds. When used with the /V switch, CHKDSK also displays a list of the path and name of every file on the drive. This list is sent to the file ALL.TXT using the DOS redirection symbol (>).

The FIND command does the actual work of finding the file. It looks through the file ALL.TXT for the filename you've typed on the command line. (DOS substitutes the filename for the %1 when the batch file executes.) The filenames produced by the CHKDSK command are in uppercase. FIND is case-sensitive: As far as it's concerned, MOM.LTR and mom.ltr are different files. (This is why FILENAME must be uppercase.) When a match is found, the complete path of the file is displayed on the screen. The last line of the batch file cleans up by deleting the file ALL.TXT.

Formatted Output

I'm having trouble writing a checkbook-balancing program. I'd like my program to display numbers with two decimal places of precision. Can you show me how to do this?

Keith Bovee
Portland, OR

The simplest solution to your problem is to use the PRINT USING statement instead of the more commonly used PRINT statement. The PRINT USING statement is very versatile; it can format the output of both string and numeric data. The syntax for this statement is

PRINT USING stringexpression; expressionlist

Replace stringexpression with a string or variable containing special formatting characters (listed in your BASIC manual). The formatting characters tell the computer exactly how it should display the expression that follows the semicolon. The expression can be either string or numeric data, and you can include more than one expression.

Perhaps the most common use of PRINT USING is to format numeric data, a task that requires only two formatting characters. The pound sign (#) reserves a digit position within the output string, and the dollar sign ($) stands for a dollar sign. For example, type in the following program and then run it:

```
10 X = 1234.56
20 PRINT X
30 PRINT USING "$####.##";X
```

The first PRINT statement strips the decimal places and prints 1234. That's normal in BASIC, but not appropriate in a program that requires a dollars-and-cents format. The PRINT USING statement prints $1234.56 in a more readable format, complete with a dollar sign and two decimal places.

Hidden Files

I've seen references to "hidden files" such as IBMBIO.COM and IBMDOS .COM. How are these hidden files created? Are hidden files copied when you copy one disk to another?

Michael Vaughan
Madison, WI

To answer your last question first: The DISKCOPY command copies all files, including the hidden files that are ignored by most other DOS commands, including COPY. Any bootable DOS disk for the PC contains the hidden files IBMBIO.COM and IBMDOS.COM (these files are usually called IO.SYS and MSDOS.SYS on compatibles).

Hidden files do not appear when you look at the disk directory with the DIR command from DOS or the FILES command from BASIC. However, you can see them with the CHKDSK command. From DOS, type the command

```
CHKDSK /V
```

You'll see a list of files scroll by, including any hidden files on the disk.

Hidden files are used mainly for DOS system files and are of little use for ordinary programs. After all, what good is a BASIC program that you can't load or a data file you can't open for reading? The same is true of most DOS commands: If a file is hidden, you can't copy it with COPY, list it with DIR, or execute it by typing its name from the DOS prompt. Creating a hidden file from within a BASIC program isn't easy, since BASIC provides no direct means for handling such files. DOS provides interrupts for reading and writing to a disk sector, but you'll need a machine language subroutine to call these interrupts from BASIC.

The directory entry for each file includes a status byte that determines the file's attributes: whether it's a read-only file, whether the file is hidden, whether it's been archived, and so on. It's possible to change a file's status byte with DEBUG, but watch out: DEBUG is a low-level program with no safeguards. If you accidentally scramble the disk's directory, you can easily make one or more files unreadable. Clearly, changing a file's hidden attribute with DEBUG isn't for the faint of heart. If you'd like to give it a try, however, make sure that you back up the disk first. Experiment on the copy, not on the original.

To begin, type DEBUG from the DOS prompt. After DEBUG loads, you'll see a hyphen (-). This is the prompt while you're working with DEBUG. Type the command

```
L 189D:0100 0 5 1
```

to load the directory. The first pair of numbers, 189D:0100, is the address where the information is to be stored. The second number, 0, is the drive number (A = 0, B = 1, C = 2, and so on). The next number is the sector to read in. With 5¼-inch disks, the directory begins at track 0, sector 5. The last number is the number of sectors to read. After you've loaded the directory, type the command

```
D 189D:0100
```

The D command causes DEBUG to print the information read in from the disk. The central portion of the display shows the hex value of each byte, and the right portion shows each byte's ASCII value. The byte immediately after the last byte of each filename is that file's status byte. This byte determines the file's attributes. A 27 indicates a hidden system file, a 22 indicates a hidden file, and a 20 indicates a normal file.

To change a file's attributes, find the address of the file's status byte (remember to count in hex). Use DEBUG's edit command (E) to edit the contents of the byte. For example, say a file's status byte is at

PC Disk Update

We've been deluged with calls from readers looking for help with DOS commands. We think we've found the perfect solution, and we've put it on this issue's disk. *DOS Help*, a "Best of the Boards" program, gives instant online answers to your everyday DOS questions.

For those who'd like to delve even deeper into DOS, there are several good books available. Three of the best are *Running MS-DOS* and *Supercharging MS-DOS*, both by Van Wolverton, and *DOS Instant Reference*, by Greg Harvey and Kay Yarborough Nelson.

Automatic Color

Try the following if you're experiencing problems running *ColorSet* (March 1989) from your AUTOEXEC.BAT file:

- Make sure the ANSI.SYS driver is installed correctly. Load the CONFIG.SYS file into a word processor or create a new file with the COPY CON command. If you have a hard drive, add the statement DEVICE=C:\DOS\ANSI.SYS (if your DOS files are in a subdirectory other than \DOS, substitute its name for \DOS above). If you have a floppy system, your DOS directory is probably the root directory of drive A. In that case, use the command DEVICE=A:\ANSI.SYS.
- To use *ColorSet*, you really only need two files: COLOR.COM and COLORS.ANS. COLOR actually changes the colors and COLORS.ANS shows a chart of your color selections. To see how the numbers and colors match up, enter TYPE COLORS.ANS. To change the color, enter COLOR *foreground number, background number, border color number.* As an example, to set your display to a standard blue background with white text, type COLOR 15,1,0.
- If you alter your CONFIG.SYS file, don't forget to reboot your computer to make the changes current.

Double Take

When you use two joysticks to play "Arcade Volleyball" (March 1989), both volleyball players move simultaneously. This is because Arcade Volleyball allows only one joystick during gameplay. However, you do have the option of choosing a mouse or the keyboard for the other player. Or, if you have lightning-fast reflexes, you can challenge the computer.

To define the keys for a player, make sure each player is set in the correct mode on the menu. First, highlight player 1 (PL1) and press Enter until the correct mode appears. Repeat that step for player 2 (PL2). Next, highlight Define Keys, press Enter, and choose three keys for each player, even if one of the players is set in joystick, mouse, or computer mode. Then highlight Play and press Enter.

Tandy Tip

Tandy owners beware. If your mouse plugs into one of the joystick ports, you probably can't use the mouse option with Arcade Volleyball. The program checks for the presence of a joystick but not a mouse. Your system may lock up if a mouse is installed when you run the program. If you have this problem, you should take the statement that loads the mouse driver out of your startup file. After you've made the change and saved the file, reboot your computer. Then use the keyboard or the joystick option when playing the game.

DOS Dilemma

If you've encountered the error message *Can't find file:* when you try to uncompress the archived files from the PC disk, read on. We've discovered that on some of our readers' systems, the wrong version of COMMAND.COM has found its way into the root directory of a hard drive or DOS boot disk. This is especially true if a system has been upgraded from a lower version of DOS.

Check to see whether this is your problem by rebooting your system and looking at the DOS version that comes up on the screen after the DATE and TIME prompts. If the DOS version doesn't appear, rename your AUTOEXEC.BAT file (REN AUTOEXEC.BAT AUTOEXEC.OLD). Then reboot your computer. Keep in mind that this version number is the DOS version of the COMMAND.COM file.

Next type VER at the DOS prompt to see the version number of the DOS system files. If the VER command displays a different DOS version from the one in the boot-up message, copy the COMMAND.COM file from your original DOS disk (the same version number as your system files) to the root directory of your hard drive or boot disk. Rename your AUTOEXEC.BAT file again by entering REN AUTOEXEC.OLD AUTOEXEC.BAT. Reboot your computer; then try to uncompress the files from the PC disk.

What's Up, DOC?

An executable file (a program that runs from the DOS prompt) ends with a COM or an EXE extension. The only other type of file that runs from the DOS prompt is a batch file, which ends with a BAT extension. A text file is not an executable file and usually ends with DOC or TXT. It must be read using the DOS TYPE command, a text lister such as "TurboTYPE" (July 1989), or a word processor. To read an ASCII text file using the DOS TYPE command, enter TYPE *filename.ext* at the DOS prompt. You can stop the screen from scrolling by pressing Ctrl-S.

DISKCOPY Confusion

If you're having problems using DISKCOPY to copy our disks, you're probably using a 5¼-inch high-density disk drive (high-density disks contain 1.2 megabytes of disk space). The PC disks are double-density format (360K per disk). The DISKCOPY command won't work with disks that use different formats. This includes copying 5¼-inch disks to 3½-inch disks and vice versa.

To make a backup copy of the PC disk, format a blank disk with the FORMAT command. Then if you use DOS 3.2 or higher, use the XCOPY command with the /S and /E options to copy all the files and directories from the PC disk to your high-density disk. (See your DOS manual for more details on the XCOPY command.)

If you use a version of DOS earlier than 3.2, use the COPY command. Since COPY doesn't automatically copy the files located in a directory, be sure you also copy the files in the directories. To check for directories on the disk, type DIR (not DIR/W) and look for a file that has <DIR> beside it in the directory listing.

If you have a single- or dual-floppy-drive system, type COPY A:*directory**.* B: to copy the files in a directory from one disk to another. If you have a hard drive, type MD C:\COMPUTE to create a directory (assuming your hard drive is drive C). At the C:\> prompt, type CD \COMPUTE to move into the COMPUTE directory, and then create a directory for each issue (for example: MD SEPT89). To copy the files from the disk in drive A to the hard drive, type COPY A:*directory**.* C:\COMPUTE*directory*.

— Joyce Sides

address 189D:018B and has a value of 20 (indicating a normal file). To make the file a hidden file, type the command

E 189D:018B

Debug displays the byte's current value (20) and waits for you to type in a new value. Type 22 and press Enter. This changes the status byte, but only in the computer's memory. In order for you to make the change on the disk, the sector must be written back to the disk. To do this, enter the following command:

W 189D:0100 0 5 1

This command instructs DEBUG to write out memory starting at address 189D:018B to drive 0, sector 5. One sector's worth of data is written. Type Q to exit DEBUG; then get a directory of the disk you've just changed. Since the file is now hidden, it's no longer displayed in the directory listing. To recover the file, repeat the process and change the file's status byte back from 22 to 20.

To the Top

I'm a new user, and I'm having some trouble with subdirectories. I bought a copy of *XyWrite* and installed it on my hard drive in a subdirectory called XY. I wanted to create a subdirectory called BOOK for a book I'm writing in the *XyWrite* subdirectory, so I entered the following commands:

CD \XY
MD \BOOK

This should have created a subdirectory called BOOK, but when I typed DIR, it wasn't there. What's going on?

Robert Smith
Knoxville, TN

These commands created a subdirectory called BOOK, but it's not where you expected it. What you've actually done is to create a subdirectory called BOOK in the root directory of your hard drive.

The backslash character actually has two meanings. If it's used at the beginning of a pathname, it means that the path begins from the root directory. Thus the command MD \BOOK tells DOS to go to the root directory and make a subdirectory called BOOK. The command you need to type is MD BOOK (without the backslash).

The confusing part is that DOS also uses the backslash as a separator between directories. For example, the full pathname of the BOOK subdirectory is C:\XY\BOOK. The first backslash indicates the root directory, but the second backslash is just a separator between the XY and BOOK directories.

While this may be confusing for beginners, it allows seasoned users to accomplish tasks with a minimum of keystrokes. For example, let's say you've logged on to the hard drive and are working in the XY directory, which has a subdirectory called LETTERS. You change to drive A to run another program, but notice a file you'd like to copy to the LETTERS directory. You could type COPY filename C:\XY\LETTERS, *which would work; but there's an easier way to accomplish the same task. DOS remembers that your default directory on drive C is XY, so the command* COPY filename C:LETTERS *does exactly the same thing with fewer keystrokes.*

PC SpeedScript

Is *SpeedScript* available for the PC? It would be a blessing for me since I'm an expert *SpeedScript* user on the 64, but now I have a PC. I can't find a word processor for the PC that I enjoy as much as *SpeedScript*.

Harold Burns
Portland, OR

I've used *SpeedScript* on my Commodore 64 ever since it was published. I now want to use this word processor on my PC compatible. Can you tell me if there's a PC version of *SpeedScript* available?

Rowland A. Rupp
Snyder, NY

We at COMPUTE! have been very pleased and flattered with the many requests we've received for a PC version of SpeedScript. *As this column is being written, a PC version of* SpeedScript *is not available. However, Randy Thompson, one of COMPUTE!'s associate editors, is hard at work putting the finishing touches on a PC version of* SpeedScript. *The finished product should be available sometime in August. Stay tuned for further details.*

Modem Information

I've finally decided to get into the telecommunicating world. I've been looking at modems, and I'm dazzled by all the different terms and features. Can you give me some tips on what to look for in a modem?

Andy Svendsen
New Lenox, IL

Buying a new piece of hardware can be confusing, especially if you don't know much about it. When talking to a modem vendor, you'll hear terms like baud, bits per second, auto-answer, *and more. Here are some of the most important terms and a short description of each:*

Baud rate. *The more technically correct name is* bits per second. *This is probably the most important consideration when you're buying a modem. Simply put, it's the rate at which the modem transfers information. A speed of 1200 bps is fairly standard right now; however, 2400 bps is becoming increasingly popular. If you're going to spend a lot of time on commercial bulletin boards or make a lot of long-distance calls, buy a 2400-bps modem. The money saved on your phone bill will more than offset the difference in cost between a 1200- and a 2400-bps modem.*

Duplexing. Half-duplex *and* full-duplex *indicate whether information can be sent and received at the same time. Failure to match your modem's duplexing ability with that of the modem on the other end of the line may result in character duplication or echo.*

Auto-answer. *This feature is necessary if you want to be able to automatically answer calls from other computers (for example, if you want to set up a bulletin board system for others to call).*

Auto-originate. *This feature lets your modem dial phone numbers to call other computers (a very useful feature).*

Self-test. *Some modems have the ability to test themselves to see if everything is connected correctly and working.*

Carrier-detection indicator. *How can you tell if you've connected with the computer on the other end? Most modems have a way of indicating this either by a light or an LED on the modem itself, or by a signal that appears on the screen.*

There are a number of other things to consider when you're buying a modem. These include:

Internal or external type. *An internal modem fits into one of your PC's internal slots, while an external modem connects to your computer via a serial port. While many people buy internal modems to conserve desk space, you may want to consider an external modem. If you ever bought another computer like an Atari ST or Apple Macintosh, an internal PC modem would be incompatible with it. However, an external PC modem might work as is, or, at the very worst, you'd only need to buy a new cable to use it with your new machine.*

Power supply. *Your modem must operate from some form of power source. If you buy an external modem, the source is usually a wall socket or an internal battery. Internal modems draw power directly from the computer.*

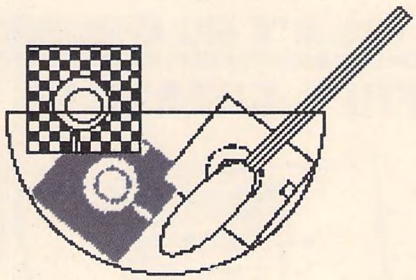
Cables/connectors included. *Connecting your modem to your computer may require the purchase of additional cables or connectors such as an RS-232 cable.*

Terminal software included. *Some modem packages include terminal software. If the one you buy does not, you'll need to purchase telecommunications software.*

Hayes-compatible. *Most modems recognize the full Hayes command set, but some recognize the commands but fail to carry them out. To be safe, make sure your modem is 100-percent Hayes-compatible.* **PC**

Compilation and responses by Jim Fuchs

INTRO DOS



Stirring Up Another Batch

Tony Roberts

Whether you're a novice or an expert, you can use batch files to automate your repetitive tasks. To create a batch file, you'll need a text editor or word processor that saves its files in standard ASCII format. Your word processor probably has an option for this. You can also use *SLED*, a text editor published on disk in our January 1989 issue. *SLED* is quick and easy to use.

Batch files can be called anything you like as long as they conform to DOS's file-naming rules and end with the extension BAT. Keep the filenames short so they'll be easy to type and remember.

To get started, think of the most common operation you perform with your computer. Let's say your primary application is word processing. To start that application, you change directories to the word processing directory and then start the program. When you exit the program, you change back to the root directory.

To automate this process, start your text editor and create a file—we'll call it EDIT.BAT—that contains the sequence of events described above. Enter the commands exactly as you would from the keyboard. Here's what it might look like:

```
CD \WPDIR
WPPROG
CD \
```

It's that simple. Next time you start your word processor, just type EDIT at the DOS prompt and let the file do the work for you. You can quickly set up short batch files like this for all your applications.

Once your batch files are in place, it's easy to make them bigger and stronger as your computing needs grow. For example, we'll create an enhancement for our simple EDIT program.

Batch-O-Matic

Most word processing programs let you enter the name of the file you want to edit on the command line. To incorporate this feature into your batch program, change the second line so that it reads WPPROG %1.

The %1 is called a *replaceable parameter*. When you run the batch file, the %1 is replaced by the filename that follows the name of the batch file on the command line. If you type EDIT SAMPLE.TXT, the batch program starts the word processor and loads the file SAMPLE.TXT for editing.

Even though this batch program has a replaceable parameter, you don't have to use it. If you simply execute the command EDIT, the word processor loads and waits for your next command as before. It's possible to pass several pieces of information to a batch file by using additional replaceable parameters. As mentioned, %1 stands for the first word following the batch file's name on the command line, %2 stands for the second word, and so on.

Return to Sender

The batch file we've built so far works fine. It starts the application and returns to a predetermined point—the root directory. If you want the batch file to return to the subdirectory from which you called the program, things get a good deal more complicated.

The added complication doesn't really matter, because once the instructions are typed into a batch file, the computer handles the dirty work for you. The program is shown below. The line numbers are for discussion purposes only; don't type them in.

The key to this program is its use of additional files, two temporary and one permanent. The permanent file we'll call CHDIR.TXT. Create this file in the root directory by entering COPY CON CHDIR.TXT. Then type CHDIR, press the space bar, and then press F6. This operation creates a file that contains the command CHDIR, the DOS change-directory command.

The final version of EDIT.BAT is shown below. Line 1 turns off the echo so that you don't see the commands being executed. Line 2 executes the CHDIR command, which, when executed by itself, returns the current path. The "> \HOMEDIR" in this line redirects the output of the CHDIR command to a temporary file called HOMEDIR in the root directory.

Line 3 appends another command, "ERASE \RETURN.BAT," to the HOMEDIR file. The double greater-than symbol is also a redirection symbol, but it appends information to an existing file, whereas the single greater-than sign creates a new file (erasing any existing file with the same name).

Using the combine feature of the COPY command, line 4 takes the information in CHDIR.TXT and HOMEDIR and combines it into a new batch file called RETURN.BAT. This file contains two commands. One changes the directory to whatever was current when the batch file was executed, and the other is a command that erases RETURN .BAT itself.

Line 5 erases the HOMEDIR file since it's no longer needed, and lines 6 and 7 are the word processing application we worked with earlier. This is where you substitute the commands necessary to run your application.

Line 8, which is executed as you exit your application, gets you back to the original subdirectory. The program ends with a *Batch file missing* message from DOS. This message is accurate, but of no concern. It results from the batch program RETURN.BAT issuing a command to delete itself.

Those using DOS 3.3 or higher can solve this problem with a little rewriting. First, eliminate line 3. Change line 8 to read CALL \RETURN and add a final line reading ERASE \RETURN .BAT. This takes advantage of the CALL command introduced in DOS 3.3. This command allows the execution of a secondary batch program and then returns to the original to pick up where it left off.

A final cosmetic change for users of DOS 3.3 and above would be to change the ECHO OFF command in line 1 to @ECHO OFF. This improves the appearance of the program by making the command itself invisible.

```
1 ECHO OFF
2 CHDIR > \HOMEDIR
3 ECHO ERASE \RETURN.BAT >>
   \HOMEDIR
4 COPY \CHDIR.TXT + \HOMEDIR
   \RETURN.BAT > NUL
5 ERASE \HOMEDIR
6 CD \WPDIR
7 WPPROG %1
8 \RETURN
```

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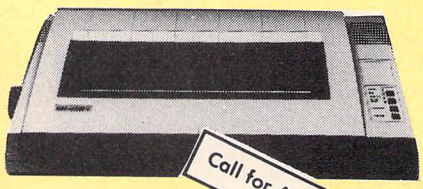

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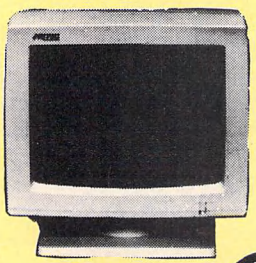

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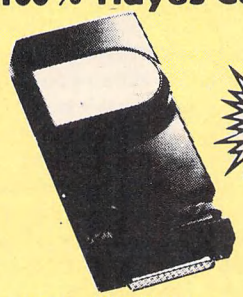

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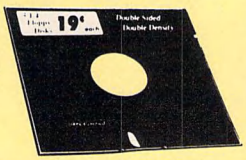

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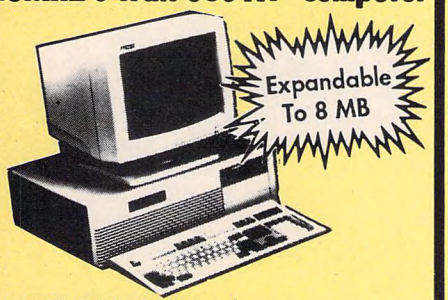

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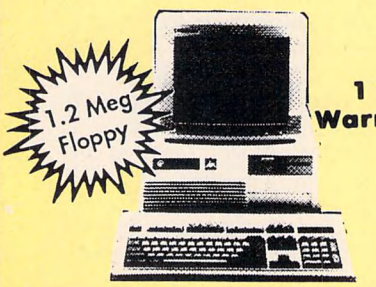

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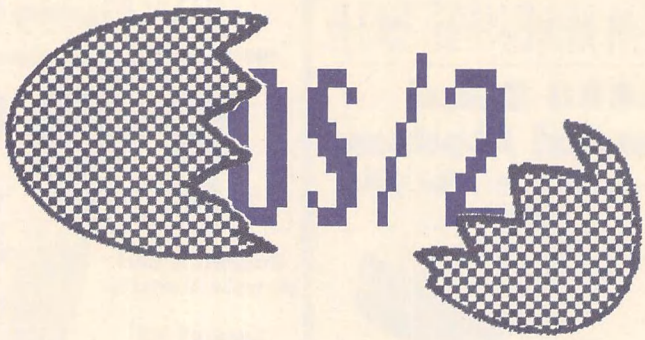

OS/2 Offers a Lot, If You Can Wait

Robert A. Moskowitz

By now, all of us have heard the best and the worst about OS/2. Probably fewer than 5 percent of PC users have actually put their hands on a PC equipped with IBM and Microsoft's newest brainchild—but virtually everyone has an opinion about it.

In the past few months, I've had the opportunity to work with OS/2 and to talk with people who understand many of its intricacies. In my judgment, OS/2 takes the ordinary PC to a whole new and much higher level of flexibility and power.

Chicken or Egg?

The PC's new flexibility and power under OS/2 is still largely a matter of potential. Like any operating system, OS/2 needs applications to deliver its features. And, like any new operating system, it will be awhile before a large number of applications support OS/2.

There are critics who complain that OS/2 is a dog, because today, more than two years since it was first unveiled, applications developers are still shy about committing their resources to the new operating system.

But support from developers is, by and large, a business decision, not a technical judgment. Developers are cautious about spending the time and money required to build an OS/2 application until a sufficient number of users demand them and stand ready to buy them. In real terms, developers won't like OS/2 very much until they see a million or more users with the operating system installed on their PCs. Then they'll love it.

Meanwhile, users complain that OS/2 doesn't provide the same variety and power of business solutions they get from DOS, and many of them are refusing to buy OS/2 and OS/2-capable PCs until more OS/2 applications reach the market. This shows only that users can't buy the applications they want, not that OS/2 doesn't work. In real terms, users will avoid OS/2 until they see several thousand applications on the market. Then they'll love it, too.

Waiting Game

This is the usual waiting game. But it's taking somewhat longer than usual because the installed base of PCs and non-OS/2 operating systems is so much larger than ever before. With so many PCs already working, any movement toward a new operating system will always appear to be incremental.

Another interesting criticism of OS/2 is that it's difficult for programmers to use. Don't pay any attention to this argument. This is like airplane mechanics complaining about the 747 because it's so difficult to build and maintain. From where the users and owners sit, the new technology is clearly superior to the older alternative.

In case you're wondering, I'm not on either IBM's or Microsoft's payroll. But I do feel that the vast majority of users will move to OS/2 over the next five years. Why? Because, as users, we don't care about marketing issues, or technical details, or what other people tell us to think. All we really care about is capability. And OS/2 has plenty of that.

Sweet Sixteen

Unlike DOS, OS/2 was developed to support more than one session at a time. Each session consists of one or more applications plus access to all the computer resources the applications require. OS/2 can support up to 16 sessions at once, including one session dedicated to DOS and one dedicated to OS/2's new graphics-based user interface, Presentation Manager.

Each session runs independently, with all of its access to the computer resources carefully monitored and controlled by the central kernel of OS/2, which never gives up control over the PC. Except for the DOS-compatible session, an OS/2 session can run equally well in the foreground or background.

OS/2 creates a *virtual*, or imaginary, keyboard and display screen for each session and continually updates them as the session runs. When you select a session for foreground processing, nothing changes except that OS/2 simply switches that session's virtual keyboard and display to the PC's actual keyboard and display.

The DOS session was designed and included in OS/2 to improve the migration path from DOS to OS/2. It's not entirely successful—many DOS applications won't run within the DOS session. Those that do often run slower than they run in native DOS or in other DOS multitasking environments like Windows and Desqview.

But within the next five years, most DOS applications are likely to seem hopelessly outmoded by the advanced features and graphics of OS/2 applications. DOS compatibility won't matter much anymore, because DOS, like the Apple II, will be left fondly behind.

Memory Bank

OS/2 can address up to 16 megabytes of memory, considerably more than the 1 megabyte DOS was designed for. The new operating system knows tricks to utilize virtual memory, too. So if you have installed less than 16MB of RAM,

OS/2 can automatically swap memory segments to and from a hard disk to function almost as well as if it actually had all that RAM.

Another, probably more important, way that OS/2 outshines DOS is its internal modularity. In DOS, the COMMAND.COM file controls virtually every function and process, but it sometimes turns over control of the computer to an application. In OS/2, various modules control various portions of the computer's hardware and software resources, and OS/2 never relinquishes control.

With DOS, you have to rewrite COMMAND.COM to make a modification. And even then various applications may still have their own way with the computer—which is why *WordStar*, which writes to the display screen with its own resources, is so tough on multitasking DOS environments and can bomb other applications.

To modify the action of OS/2—say to add a voice interface or to operate some peripheral we can't even imagine yet—you simply rewrite the appropriate module. The rest of the operating system won't even know you've made a change, and all the active applications remain protected from unwanted interference.

In addition, OS/2 incorporates a variety of hooks, interfaces, and intelligence that DOS could never accommodate. These facilities are relatively dormant in OS/2 today. But as more and more sophisticated applications reach the market, OS/2 will support a much more integrated style of cooperation than ever seen before.

Weaving Threads

Inside OS/2, each session consists of one or more applications. Each application consists of one or more processes—such as writing to a file, modifying the display screen, and sending or receiving data through the serial port.

Each of these processes actually consists of many tiny chains of computer instructions called *threads.* OS/2 can manage 255 of these threads at one time, and it's set up to continually feed threads from different sessions to the central processor. Under this scheme of operations, OS/2's processes, applications, and sessions can be mixed, matched, and time-shared to produce an interactive and flexible environment.

For example, under OS/2, your PC can download data through a modem, load that data into a database-management application, sort and calculate the database, graph the results, and print the graphs—all at one time! Meanwhile, you can monitor the data as it's being processed, or you can relegate all the tasks to background processing and work on an entirely different project in the foreground.

Factory Reconditioned

As a practical matter, one of the biggest impediments to OS/2 is the success of DOS-compatible multitasking environments such as Windows, Windows/ 386, and DESQview. In many cases, these products break through the barriers surrounding DOS and provide some of the same features that OS/2 currently provides. They make sense for people who are frustrated by today's DOS limitations, but they blunt the frustration that might otherwise force users to migrate immediately to OS/2.

Despite their immediate advantages, today's DOS-based multitasking environments in no way compete with the potential power of a full-blown OS/2 application running in a full OS/2 environment. It's the difference between the 747 and a 707 retrofitted with new engines and avionics. There's simply no way the older design can be as flexible or provide as much performance as the newer machine can. **PC**

Robert Moskowitz is a business consultant based in Woodland Hills, California. His background includes numerous articles published in a variety of national magazines. He is the developer of the computerized Personal Productivity Audit.

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PC NEWS & NOTES

Arlan R. Levitan & the Editors

Made in America

Tandy is expanding its computer-assembly facilities in Fort Worth, Texas. It needs to add manufacturing capacity for its Tandy-built Panasonic PCs and new MS-DOS laptops that will be sold under both the Radio Shack and Panasonic brand names.

In a discussion following the new plant's groundbreaking ceremony, Tandy's CEO John Roach hinted that Tandy subsidiary GRiD Systems has notified several major laptop manufacturers that their machines may violate patents held by GRiD. These patents concern the design of screens that fold down to cover the system keyboard.

It's My Party

In other legal news, the U.S. Patent Office granted Quarterdeck Office Systems a wide-ranging patent covering multitasking and window technology that may put the brakes on the momentum of products such as Microsoft Windows, Hewlett-Packard's New Wave, and even OS/2's DOS-compatibility box.

According to sources inside Quarterdeck, those products may infringe on the patents covering technology developed for Desqview, a popular software package that lets PC users run multiple programs concurrently on MS-DOS–based computers.

Kindest Cut

The price of name-brand 80286-based AT compatibles continued to fall in April, as Dell Computer announced big cuts in the price of its packaged System 200 computers. The price of a 12.5-MHz 80286 system, with a 20MB hard drive and a monochrome monitor is now only $1,699—down an even $400.

If rolling your own system is more to your liking, AST Research may have the fodder for your computer composting. At Spring COMDEX, the firm unveiled their new budget-priced AT clone, the Bravo/286, a compact 8-MHz zero-wait-state system with a $1,095 list price. It includes 512K of RAM, an extended keyboard, and an integrated floppy/hard disk controller, but no drives. Big Blue is apparently feeling the competitive pressure. In April, IBM reduced the list price of its popular PS/2 Model 50Z with a 30-meg hard drive to $3,250—down a whopping $745.

Friendly Virus

Laptop users often need to transfer files between their portable systems and desktop machines equipped with only 5¼-inch floppy drives. Fortunately, there are a variety of easy-to-use file-transfer packages that shuttle data between the serial ports of the two systems with a null-modem cable. One of the problems with this method is the inconvenience of having to carry the software in multiple formats, so that both the master and slave systems can communicate.

New versions of *Laplink* and *FastWire*, two popular file-transfer packages, have eliminated this hassle. They've added the ability to automatically clone or bootstrap the code needed by the desktop system over the cable linking the two systems. Now if someone could just figure out a way to eliminate the cable. . . .

Try, Try Again

Atari continued its long-standing COMDEX tradition of straining credibility to the max by announcing a new line of 80286- and 80386-based MS-DOS machines that "will ship during the second half of 1989." Attendees tried to maintain their composure as they remembered the last line of Atari PCs that were announced but never shipped. Despite its past record, Atari is determined to try again.

First, there's the mostly PC-compatible Atari Folio, a one-pound hand-held computer. According to Atari, the Folio will come with 256K of RAM (expandable to 640K), with MS-DOS in ROM, a 63-key keyboard, an 8 line × 40 character liquid-crystal display, and a port for transferring files to and from other PCs. The Folio will also accept credit-card-size program cards that offer an appointment calendar, a calculator, an address-and-phone list, a word processor, and a spreadsheet with "limited *Lotus* compatibility."

The Folio sounds tempting, if you don't mind plunking down $299–$399, but, if Atari's past announcements are anything to go by, we may never see the machine. Atari was apparently so concerned about pilferage that they kept the Folio locked up under glass for the length of the show.

If Atari can't interest you in a Folio, how about a PostScript-compatible version of its $2,199 laser printer? Someone at the show even suggested that Atari might throw in the Golden Gate Bridge for free.

Say What?

It may not be a PC in the truest sense, but Advanced Products & Technologies' new hand-held Explorer Voice Computer is right out of science fiction. The three-pound Explorer looks like an oversized communicator from "Star Trek" and can reportedly translate its user's spoken words directly into foreign-language words, which are stored one by one and then spoken as a sentence by the on-board voice-synthesis hardware.

An English-to-Spanish cartridge will ship with the first units, and English-to-Japanese and English-to-French cartridges are now in development. According to the manufacturer, the Explorer is capable of translating 35,000 different sentences and can address up to four megabytes of cartridge memory. Even more amazing is the Voice Computer's suggested list price of $2,330.

Warp Factor

While a battalion of manufacturers was proudly showing systems based on Intel's new 33-MHz i80386 chip, the biggest news at COMDEX was the rollout of Intel's new i80486 central processor. According to the manufacturer, the successor to the 80386 is capable of 14–15 million instructions per second (MIPS).

To put things in perspective, that's about *50 times* the power of the original

IBM PC. The new chip is upward compatible with the 80386; any program that will run on the 386 will run on the 486 without modification. The new chip also features an on-board math coprocessor that will yield a further tenfold increase in performance for numerically intensive floating-point operations.

Don't start saving your pennies yet for a PC with an i80486: The chip itself will cost over a cool grand for some time. The first complete systems built around the new chip will be shown at Fall COMDEX and are expected to be priced between $15,000 and $20,000.

Photo Finish

Chip manufacturer Motorola tried to steal some of Intel's i80486 thunder by announcing a 50-MHz version of its 68030 CPU and releasing the specs of the soon-to-be-available 68040. However, Apple Computer is said to be in no hurry to slap either of the new chips into its Macintosh line of computers. Rumor has it that Mac II and Mac SE/30 owners will have to be content with puttering along at 16 MHz until the fall of 1990. A 68040 accelerator card for the Amiga 2000 and a 68040-based Amiga 3000 are supposedly due before then from Commodore.

Bridge Builder

Amiga 2000 owners can now have all the joys of AT-class computing without the embarrassment of putting a PC next to their Amiga. The Commodore A2286D Bridgeboard plugs directly into a slot on the 2000 motherboard and adds an 8-MHz 80286 processor with a full megabyte of RAM. The Amiga Workbench environment lets Bridgeboard owners run MS-DOS applications in one window while running Amiga applications at the same time in other windows. The AT Bridgeboard is priced at $1,599, comes with a 1.2MB 5¼-inch drive, and allows a hard disk to be shared by MS-DOS and AmigaDOS.

Big Blue Rocket

Industry insiders were surprised to see IBM demonstrating prototypes of an add-on 80486 accelerator card for Micro-Channel–equipped PS/2s after hours at COMDEX. Even more surprising was the absence of the long-anticipated 386SX-based PS/2 Model 55. In the months that preceded COMDEX, frequent reports pegged the Model 55 at a retail price between $3,000 and $4,000, depending on whether it was equipped with a 30MB or a 60MB hard drive. Post-COMDEX intelligence indicates that IBM may back off from offering the 386SX in a micro-channel machine and use the chip to upgrade the profile of the PS/2 Model 30, considered by many to be a sitting duck when pitted against cheap PC and AT clones.

Any Day Now

Applications designed specifically for OS/2 continue to be conspicuous by their absence on store shelves. Although a score of software firms at COMDEX were demonstrating programs running under the OS/2 Presentation Manager, few are actually delivering product. Aldus is apparently six to nine months behind schedule with *PageMaker* for OS/2. Even OS/2 author Microsoft is having difficulty, with announced PM versions of *Microsoft Word* and *Excel* lagging far behind.

Getting Kahned

Phillipe Kahn, Hawaiian-shirt-clad chairman of Borland International, apparently believes in the old saw *Don't get mad, get even.* Last year, Lotus chairman Jim Manzi made some unkind cuts at Borland in a newspaper interview. In March, both Kahn and Manzi were attending a computer-related conference in Palm Springs, California. Kahn showed up with some excess baggage: about 1000 copies of a magazine that featured a less-than-complimentary piece on Manzi. Kahn disposed of the surplus reading material by slipping the magazines under the hotel room doors of conference attendees.

Double Your Fun

Want to improve the performance of your AT's hard drive? Western Digital's new Speedkit hard disk controller, according to the company's Alexis Colicchio, doubles the usual AT data-transfer rates. The $225 board boosts drive performance through the use of an advance look-ahead cache. It also uses algorithms that diagnose disk activity on the fly and preload data for maximum transfer efficiency.

Library Card

The cost of owning a CD-ROM player continues to fall. Toshiba's new XM-5100A drive can be used with a PC or Macintosh and lists for only $650. At that price, new CD-ROM disc titles such as the complete *Sherlock Holmes* ($70), *Sporting News Baseball Guide* ($149), and the *CIA World Fact Book* ($99) may find their way into the hands of home users. Watch for the list price of players to dip below $450 by year's end. **PC**

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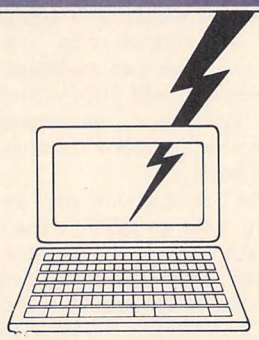

Watch Your Language!

Tom Campbell

This month we're going to draw back a bit and discuss a really down-to-earth subject: interpreters vs. compilers. Even if you think you're hip to the differences, read on. You might be surprised.

Inside the CPU

Let's talk about the 8088, 80286, or 80386 that drives your PC-compatible machine (there are some rather obscure Intel processors, such as the 80188, and this discussion applies equally well to them, too). Note that the terms *CPU*, *processor*, and *microprocessor* are synonymous and refer to the chip around which MS-DOS and your machine's BIOS were written.

The CPU is incredibly simpleminded, and its job in running your program is to read the next byte or two in memory and then perform a simple operation based on that value, over and over again. The nature of the operation will be discussed later. Because each instruction corresponds to a machine operation, these one- or two-byte codes (a few instructions take three bytes, especially in the 286 and 386 native modes) are called *opcodes*.

The processor runs in an endless loop from the time it receives power: It reads bytes from memory and acts on them. (Because of this, I chafe when people refer to the CPU as the brain of a computer; it's actually more like a heart, pumping an endless bit stream through its chambers. The operating system coordinates groups of those instructions—programs—so it really deserves the title of brain.)

The sum of these opcodes' abilities is referred to as the chip's *instruction set*. Normally, in the PC world, we use the term *instruction* when we talk about what the opcode does, and *opcode* when we talk about the actual, constant value of the instruction itself, but there's no formal agreement as to what's what.

Programs written using these instructions are normally referred to as *assembly language* code in the IBM PC world (the term *machine language* may also be used). Most compilers generate this kind of executable code, too, but that's traditionally referred to as *compiled code* to differentiate it from hand-written assembly language programs.

Let's look at an example. In a COM or EXE program, the RET instruction returns from a subroutine, serving precisely the same function as END in a Pascal or BASIC program, or the closing bracket in a C function. In fact, those high-level language keywords compile directly to a RET instruction. There are several versions of RET, depending on the memory model, but the most common is the near return (returning from a routine in the same 64K code segment in which it was defined). The opcode for a near return is hex C3, or decimal 195.

What's in a Word?

If you've read it once, you've read it a thousand times: Binary is the common tongue among the Babel-like assortment of computer languages. But what does that mean, really?

It means that the microprocessor's bag of tricks is a very small one, at least from a software point of view. First of all, no CPU ever thinks in symbols (words) the way we do. There isn't even a concept of ASCII at the CPU level. So, right at the outset we're limited to numbers, and any means of translating those numbers into text is our responsibility.

Second, the numbers that your machine deals with efficiently also tend to be surprisingly limited. When we speak of a *16-bit* processor, we're normally referring to the maximum integer value your CPU can add, subtract, or multiply in a single instruction. This is also called the machine's *word size*. The Commodore 64's word size is 8 bits, the original IBM PC's was 16, and the Compaq 386's is 32. Even though the 80386 has a 32-bit word, it still operates directly only on integers (albeit larger ones than the PC uses). One of the reasons interpreted BASIC is so slow is that it defaults to floating-point numbers, and the CPU has no provisions whatsoever for floats. A simple test will demonstrate this. Fire up GW-BASIC, BASICA, or your favorite BASIC compiler and run the following do-nothing program:

```
10 Start = TIMER
20 FOR i = 1 TO 20000
30 NEXT i
40 PRINT "Elapsed time: ", TIMER-Start
```

Now run the same test again, this time using i% instead of i. As you probably know, the % forces BASIC to use integer math. Even on my 386, there is an increase in execution time, despite the fact that these floating-point numbers usually take only four bytes. Floating-point math routines must be handled either by a coprocessor or by hand-coded floating-point routines.

You may have heard that learning assembly language is difficult. It was for me, but I realized after the fact that my biggest problem was tangential: I had no idea how much my outlook had to change.

By its very nature, assembly is simple. A CPU has only a few talents: It can copy bytes or words from one memory location to another, compare two values, move or copy bytes from one memory location to another, set or clear the bits in a word, perform the four arithmetic operations on integers, read and write port values, call and return from subroutines, and check status flags. That's pretty much it.

Some CPUs, including the Intel chips that run MS-DOS, have additional instructions that copy rows of bytes or words (referred to as *strings* in PC assembly language) from one location

to another, as opposed to moving a single byte or word.

Registers Are Different

My other shortfall in learning assembly was in grasping the importance of registers. What I glossed over in the last paragraph was that many instructions operate on them, using registers as one or both of the operands. A *register* is a memory location with unique qualities: It has a name, not an address; it's located directly on the chip; and it performs many specialized functions on memory, ports, or other registers.

Registers almost never surface in the formal specifications of high-level languages, C being the sole exception I know of. And, because they weren't part of BASIC or Pascal, I found them to be the only truly alien concept in assembly language.

Compilers Work

Having established that the binary language of the computer is a breathtakingly limited one, we can begin to appreciate how much work a compiler goes through. Anything you give a symbolic name must be converted into a number. For example, the Pascal code to initialize the variable WordCount to 0 is WordCount := 0;. Internally, the compiler has determined that WordCount, which we'll assume is an integer, occupies two bytes somewhere in the data segment (the data segment is a 64K area of memory used for storing data). The code generated by such a line looks something like this:

```
MOV 4EF0, 0000
```

The value 4EF0 hexadecimal is the first of the two bytes and represents the address in memory of WordCount. The MOV means *move*, so you are literally moving two bytes, each of value 0, into that location. This is clearly far more efficient than an interpreter, which must always carry the baggage of the actual text containing the variable name, ensure the variable name is a valid one, and then look up that variable in a table of other variable names to see if it even exists—a series of string comparisons that take a great deal of time and that happen every time that line is encountered.

A compiler must do these same comparisons, but only once: when the program is compiled. After that, the variable names are neither wanted nor needed.

If you've ever used a debugger, you may wonder how it knows variables by name. Many compilers have an option to append this information to the end of the program file or to intermediate files generated by the compiler. This information is loaded into memory when you launch the program from the debugger. That's why programs in debuggers can never run as fast as they do outside the debugger's environment and why you're more prone to suffer heap space shortages when running a debugger.

Interpret the Lines

An interpreter reads a program line by line and calls canned subroutines to fulfill the needs of the program. Incredibly, the interpreter has no memory of previous lines nor any knowledge of future lines. For example, this program will run in interpreted BASIC:

```
10 GOTO 100
20 END
```

Although BASIC will return an *Undefined line* error after the program has been executed, it will let you run the same program again, because it doesn't keep track of syntax errors. Nor does it demand that all syntax errors be fixed before a program is run.

A compiled BASIC program insists that all such dangling references be resolved before it will produce an executable program. The typical means by which an interpreted BASIC finds line 100 in a case like this is to go to the start of the program and check each line until it finds one beginning with 100.

In a compiled program, the target of every GOTO is recorded and, upon its appearance in the source code, is resolved using a single machine instruction (JMP, for jump). Therefore, a single GOTO can easily cost tens of thousands of machine instructions in an interpreted BASIC.

Some interpreters speed performance a bit by storing the program in tokenized form. Keywords are assigned unique numbers and are stored as those numbers, rather than in text form. BASIC offers some useful illustrations of this concept. Start your BASIC interpreter and enter the following line exactly as shown (be sure to enter *print* in lowercase):

```
10 print "hello, world."
```

Now enter the LIST command, and you'll see that *print* is now *PRINT*. Once BASIC tokenizes your word, the original text is lost. An even more dramatic illustration is in *QuickBASIC* 4.0 or later, in which *print* will appear in uppercase the moment your cursor leaves the line.

Another characteristic of interpreters is that the source program is the program that is executed, whereas a compiler generates a whole new file for which the source immediately becomes superfluous (to the computer, anyway). An interpreter must have its source file to run, but the executable file generated by a compiler bears no relation whatsoever to the source code. That's why

```
10 LIST
```

is one of the few lines that cannot appear in a compiled BASIC program.

An interpreter is much easier to write than is a compiler, and if it's written in a high-level language, it becomes relatively simple to port to another operating system or processor.

A BASIC interpreter written in ANSI standard C will work on any computer for which an ANSI C is available. On the other hand, a compiler is much more difficult to move to another processor because, by definition, a significant part is written for that processor. It's possible to seal off the processor-specific parts of a compiler, thus making it easier to transport, but it's still a significant job.

What's the Dif?

It's worth noting here that, in theory, an interpreted language can do anything a compiled one can. It's also easy to prove mathematically that all a language needs is an IF and a GOTO to simulate any structured constructs such as WHILE, DO, and FOR. You can force type checking and variable declarations in an interpreted language (witness the number of C interpreters available), and you can relax type checking and variable declaration in a compiled language (as do some BASIC compilers).

Some compilers aren't. For example, the *dBase* language boasts a number of so-called compilers, but in fact they're tokenizing interpreters, albeit impressively fast ones. It would be virtually impossible to compile the *dBase* language without sacrificing compatibility, because variables can change type while a program runs, and, more important, a true *dBase* implementation can execute code (commonly, simple expressions) generated while the program is running.

That's why *Clipper*, one leading *dBase* compiler, creates no program smaller than 150K; whether it's needed or not, every EXE file contains a *dBase* interpreter. This has some interesting side effects. In third-generation languages, such as BASIC, C, or Pascal, it would be difficult to allow the input *360 miles * 6.2 kilometers* any place numeric entry was involved, but in *Clipper*, it's easy.

Threaded Interpreters

If an interpreted program can do anything a compiled program can, why not make a compiler that acts like an interpreter by compiling while the program is written? FORTH is such a language.

FORTH source code manages to be relatively machine-independent, yet there is no compile step, even though you write FORTH programs in an interpreter-like environment.

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But it's no accident that other compilers take time to compile a program, and in order to minimize the time required (as well as remain easy to implement), FORTH syntax resembles that of assembly and looks too odd for most programmers to feel comfortable with. The FORTH scheme is called a *threaded interpreter.*

QuickBASIC version 4 is another, hugely successful, example of a language that tries to merge the best of both worlds. *QuickBASIC* uses techniques that have been known for years but have never been considered practical in a commercial product.

The idea is to create a compiler for a mythical processor for which compilation is especially easy. The code generated is normally called an *intermediate language* because it's an assembly language that's not used on the target machine.

At runtime, the intermediate language is interpreted for the target processor (in this case, the PC's CPU). The thought here is that a fast intermediate-to-native-code translator can give nearly the same performance as a true native-code compiler, and that the first step (source to intermediate code) is easy enough to do in the background while the user edits the program.

When you want to create a stand-alone EXE program to run outside the integrated environment, *QuickBASIC* runs a traditional native-code compiler.

QuickBasic's intermediate code idea has the hidden advantage that all you need to do to move this compiler to another environment is rehost the intermediate-to-native translator. This is how a future version of *QuickBASIC* will be moved to the Mac, as well as *QuickC* and *QuickPascal.*

Microcode

Now that I've convinced you that interpreters don't work at the machine-code level whereas compilers do, it's time to toss a monkey wrench into the whole idea of interpreter vs. compiler.

Most microprocessors these days contain hundreds of thousands of individual components including such ancillary features as on-chip caches, and the features race has caused them to evolve faster than instructions can be implemented entirely in hardware.

Consequently, chip designers employ a "cheat" method to implement many of the more advanced, and therefore complex, instructions quickly. Instead of implementing them at the transistor level, which offers maximum speed but also makes design and debugging that much harder, a tiny interpreter is built onto the chip.

The interpreter uses short programs written using existing transistor-level instructions to accomplish a task. This gives the appearance to the assembly language programmer of a single instruction (the MULT, or multiply, instruction on the 8088 is a famous example), but, in fact, the chip is running a little program of its own every time the instruction is encountered.

As you might imagine, this approach is costly in terms of execution time. A few of these instructions are so slow that many compilers routinely insert work-arounds rather than use the instruction that nominally does the job.

The programmer in you is probably asking the instinctive question *Can I get to the microcode?* You can't on your PC, but the implications have been recognized by others.

Burroughs, a mainframe company recently subsumed by Unisys, produced a computer several years ago with a programmable instruction store. The thought was that some applications could use the extra horsepower made available by altering the instruction set to their own specifications, but Burroughs' implementation didn't exactly set the computing world on fire. More promising is a Japanese firm that claims to be developing a chip similar in concept to the Burroughs machine that emulates the 80386—or the 68030, its archrival.

Take a RISC

Where does all this complexity end? If programming in assembly is so challenging, then hacking microcode must be nightmarishly difficult. The logical counterpoint here is a return to the basics, and that's what Reduced Instruction Set Computers, or RISCs, offer.

When I first learned assembly language, it was on the 6502 found in Commodore 64s and Apple IIs. It had two general-purpose registers, versus the six or so on the PC, that couldn't even add 16-bit quantities, much less multiply them or move strings.

But it was fast. Gang up enough of the 6502's instructions, and your code could fly. One company I worked with conducted internal tests that showed a 2-MHz, 8-bit 6502 matched the performance of a 4.77-MHz, 16-bit 8088. Indeed, run GEOS, the Mac-like interface for the Commodore 64, and you'll discover that it pokes along at about the same pace as Windows on a PC.

RISCs embody this concept taken to extremes. Because registers are right on the chip, they're much faster than memory, so RISCs tend to have a lot of registers. Because microcode interpreters are relatively slow, all instructions are astoundingly simple and are completely hardware-encoded. It's not at all unusual to find a RISC chip with no multiply instructions, and that's just one of the risks. **PC**

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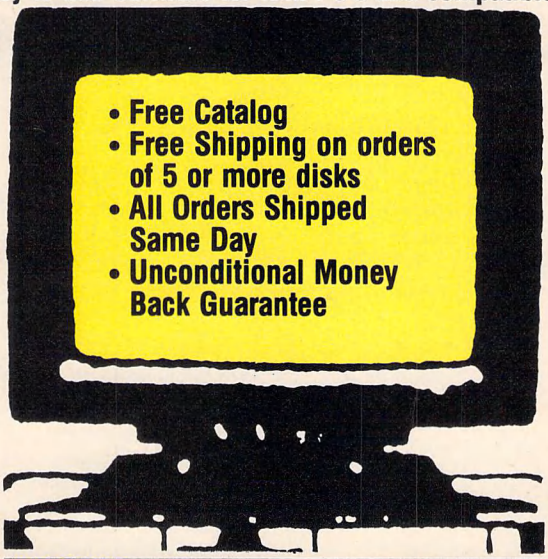

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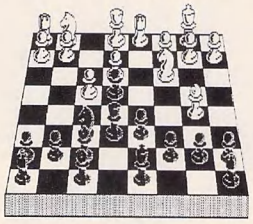

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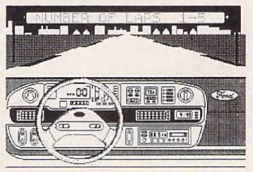

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MAXI-MAX (432) 59 macros to use with Word Perfect 4.2 or later. 11 templates for forms, border designs, etc.

GRAPHICS

KEYDRAW CAD SYSTEM (1001, 1002, 1065, 1066) (4 disks) Popular. Also uses mouse. (Requires color graphics).

SIDEWAYS (1007) Prints text sideways. Useful for Lotus.
SIMCGA/HGCIBM (1027, 1062) (2 disks) Use with Hercules graphics card/compatible to run programs requiring CGA on your monochrome PC.
IMAGE 3-D (1048) Create and edit 3-D objects. Move, scale, rotate and tip image.
FINGERPAINT (1050) Use keyboard or mouse to draw. Like MacPaint. (Requires CGA or EGA).
DANCAD 3-D (1051, 1052) (2 disks) Create 3-D graphics. Rotate, magnify, etc. Runs on CGA, EGA, or Hercules.
FANTASY (1057) Create flowing graphic images with mouse or keyboard. (CGA).
FLOWCHARTING (1078-1079) Complete system for flow charts, organizational, electrical, etc., with symbols.

SPREADSHEETS

AS-EASY-AS (505) Great. Includes screen help menus. Utilizes function keys. A Lotus clone that reads Lotus files.
PC-CALC+ (512-514) (3 disks) Jim Button's famous Lotus clone.

BASIC

PC-PROFESSOR (1401) BASIC tutorial. Good.
BASIC PROGRAM GENERATOR (1402) The menu driven way to write programs.
B-WINDOW (1407) Give windowing capabilities to your Basic program.

UTILITIES

HOMEBASE (2608, 2612, 2613) (3 disks) Complete desktop organizer. Great.
PROFESSIONAL MASTERKEY (2805) Like Norton's. Retrieve deleted files. A lifesaver.
BAKER'S DOZEN (2821) 13 utilities from Buttonware.
AUTOMENU (3003) Make PC menu driven. Incl. passwords.
SCREEN (3006) Save your monitor from screen burn-in.
DOT MATRIX FONTS (3061-3062) (2 disks) Print your test in different fonts.

ACCOUNTING/FINANCE

MARKET CGA (BUS17) Performs sophisticated analysis on stocks, funds, etc. (EGA version is BUS16).
BILLPOWER+ (BUS 40, 41) (2 disks) Bill clients for time and materials, advances, retainers, etc. Computes, taxes, past due interest, etc. Has full G/L.
CPA LEDGER (706-708) (3 disks) Complete general ledger for corporations, partnerships or sole proprietors.
PERSONAL FINANCE MANAGER (715) Household budget manager. Track checking, savings, investments.
PAYROLL USA (725-726) Up to 2,000 employees in any state. dBaseIII and Lotus compatible. Complete P/R system.
EXPRESS CHECK (786) Check account with running balance, monthly reports, etc. Prints checks.
FINANCE MANAGER II (774-775) (2 disks) For personal or small business financial management.

DOS

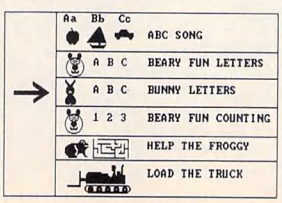
DOS TUTORIAL (1301) Teaches you to use DOS.
STILL RIVER SHELL (1304) Run DOS commands from a menu. Makes DOS easy.
BATCH FILE TUTORIAL (1305) Utilize batch file processing.
MORE DOS TIPS (1318, 1323) (2 disks) More about DOS.
HELP DOS (1326) On line DOS help with menus. Includes DOS dictionary of terms and a hints menu.

RELIGION

THE BIBLE (3301-3306) (6 disks) Old Testament, King James version.
THE BIBLE (3307-3308) (2 disks) New Testament, King James version.
WORD WORKER (3309-3310) (2 disks) Bible search program. New Testament, King James version.
BIBLEMEN (3330) Excellent Bible quiz program.

EDUCATION

AMY'S FIRST PRIMER (248) Child's learning game teaches letters, numbers, keyboard.



AMY'S FIRST PRIMER

FUNNELS AND BUCKETS (201) A fun way to learn math.
MATHPAK (202) Tutorial with lessons in higher math.
PC-TOUCH (204) Learn typing.
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State Bird CALIFORNIA VALLEY QUAIL
State Tree CALIFORNIA REDWOOD
Do you want to see a fabulous fact about CALIFORNIA? (Y/N)

SPREADSHEET TEMPLATES

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LOTUS SPREADSHEET TEMPLATES (602) Ready-made. (Requires Lotus 1-2-3)
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LOTUS TUTORIAL (630) Learn Lotus (requires Lotus).

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BIORHYTHM (1990) Display the 3 biological cycles; physical, emotional, intellectual.
FAMILY HISTORY (2203-2204) (2 disks) Create files and genealogical reports.
LOTTO PROPHET (2364) Best Lotto program we've seen.
CITY DESK (2513) Simple desktop publisher.

TELECOMMUNICATIONS

Q—MODEM 3.1 (1101, 1102, 1144) (3 disks) Powerful but easy to use. Fast.
RBBS V16.1A (1107-1109, 1150) (4 disks) Multi-user bulletin board system.
PROCOM 2.43 (1156) Outstanding modem software.

SECURITY/HACKING

COPY PROTECTION I (1219) Instructions for unprotecting commercial software.
COPY PROTECTION II (1220) More software unprotect.
COPY PROTECTION III (1221) More software to unprotect.
FLUSHOT (1225) Checks software for viruses.

DATABASE PROGRAMS

PC-FILE dB (853, 854, 855) (3 disks) Newest version! Rated better than dBase III+.
FILE EXPRESS 4.0 (803-804) Powerful system. Allows 32,000 records. Sorts to 10 fields.
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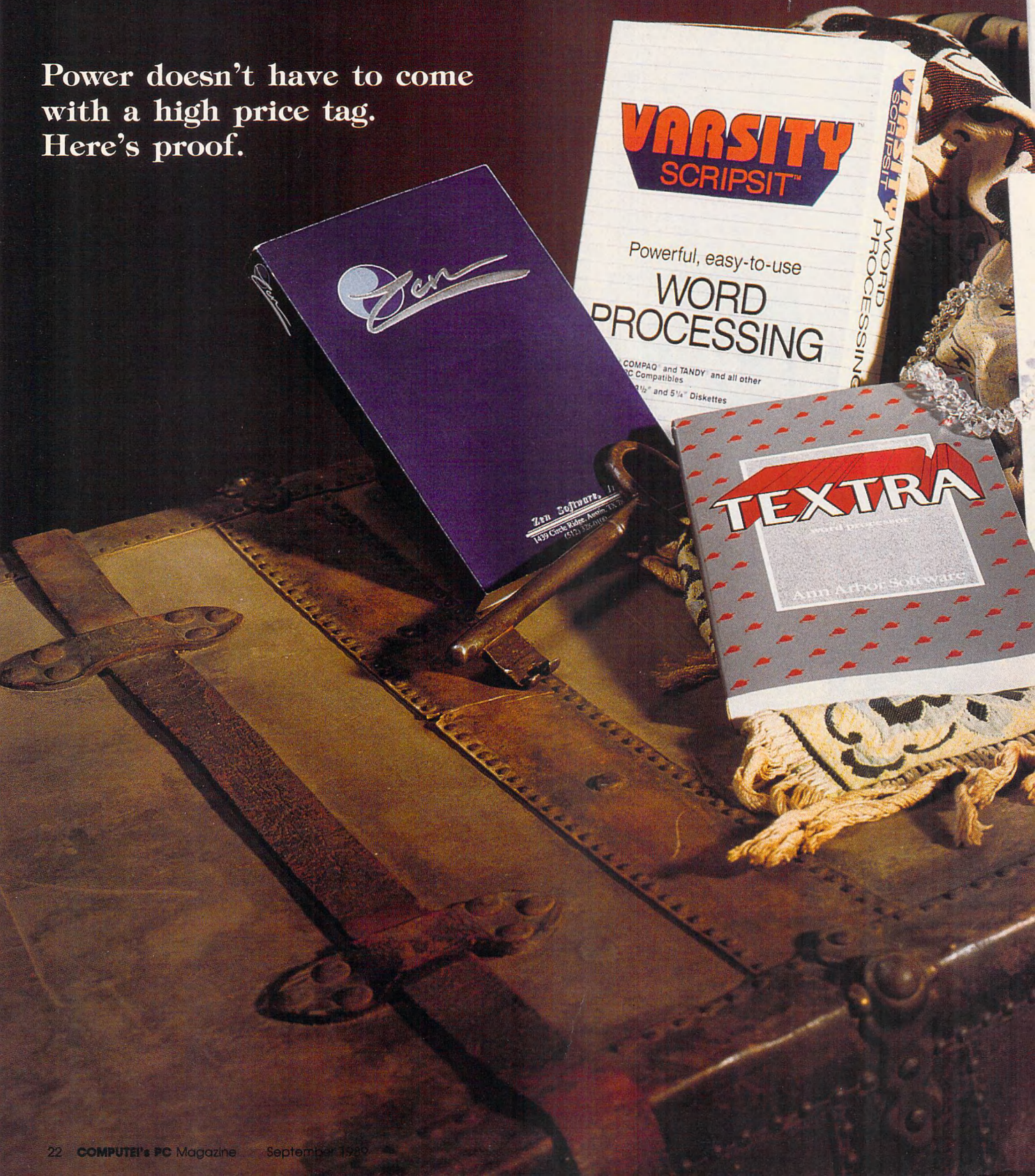
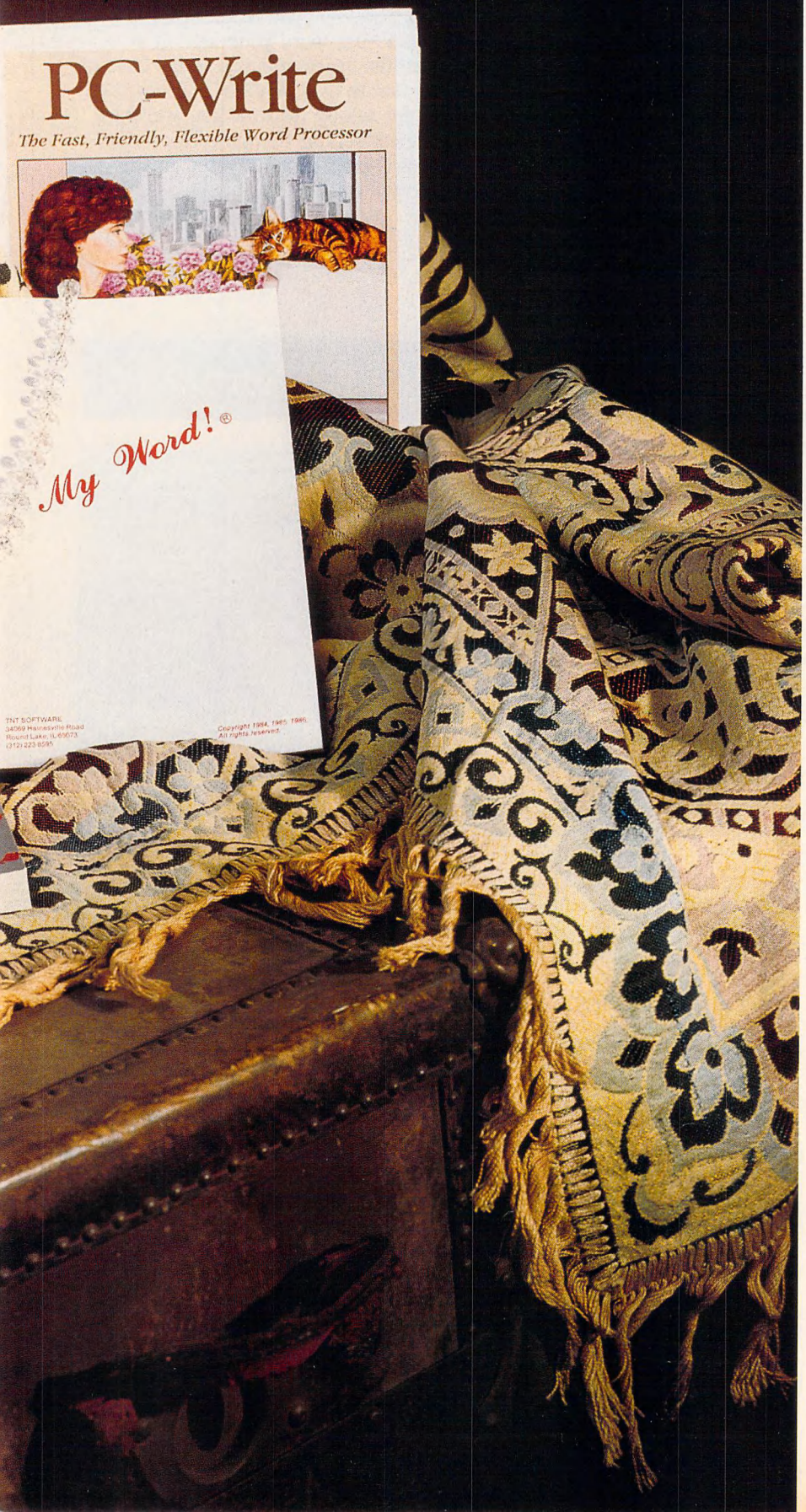
BEST-KEPT S

Five Word Processors Priced at Under $100

Power doesn't have to come with a high price tag. Here's proof.



ECRETS



It's easy to be impressed by the power and glitter of the word processing heavyweights—*WordPerfect, Microsoft Word,* and *XyWrite*—but there's an entire category of under-$100 text crunchers that are loaded with high-end extras such as spelling checkers, mail merge, windows, and macros.

To find out just what kind of power is available for under $100, we sifted through a long list of inexpensive word processors and chose five to review in depth. (For those of you interested in under-$100 word processors other than the five programs discussed here, we've included "Other Word Processors for Under $100," a buyer's guide to the other packages in this competitive price range.)

Selecting the five packages for this article wasn't easy. First we eliminated word processors that didn't include spelling checkers. This excluded several otherwise excellent products, but we feel that a spelling checker is a luxury no one should have to do without. After that, we looked at the remaining programs' features and chose five that seemed to offer exceptional bang for the buck.

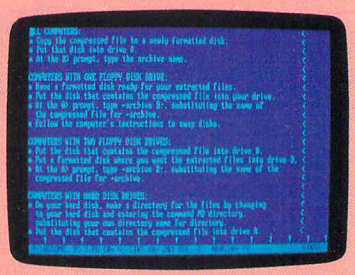
Having selected the five programs to spotlight, we subjected each to a series of tests. The results of these benchmarks surprised us, and we think you'll find them informative. Just remember to take these, or any benchmark tests, with a grain of salt. A single test result may have little to do with the way *you* use a particular program.

Finally, we gave each package to a seasoned reviewer for an in-depth, real-world test. We found their frank, careful assessments enlightening and entertaining; we think you'll enjoy them, too. And we learned one thing for certain: The power and flexibility of these under-$100 products is one of computing's best-kept secrets.

BEST-KEPT SECRETS

Five Word Processors Priced at Under $100

My Word!



"My Word! offers the best of WordStar Classic at a fraction of the price, and it adds most of the improvements we always wanted to see."

TNT Software
34069 Hainesville Rd.
Round Lake, IL 60073
(312) 223-8595
$49.00
($59.00 with spelling checker)

Writing this review using *My Word!* was a real breeze, even though I'd never used the program before. That's because *My Word!* was patterned after the venerable *WordStar* 3.3 (*WordStar* Classic, as I like to call it), and I'm an old *WordStar* hand.

And that's what makes *My Word!* so attractive: It's ideal for fans of *WordStar* Classic. If you're not a *WordStar* lover, however, much as I liked *My Word!*, I recommend you look elsewhere. If you're comfortable with *WordStar* (for example, if you're moving to a PC from a CP/M machine), or if you'd like to learn *WordStar* without spending a fortune, then read on.

My Word! offers the best of *WordStar* Classic at a fraction of the price, and it adds most of the improvements we always wanted to see: an undelete command, full cursor control, an uncluttered screen, and breakneck speed. Not only that, but it comes with the equivalent of MailMerge built in, it's fast, and you can purchase the *QuickBASIC* source code. The no-frills manual has more personality than most, and, although it's a bit chattier than I'd like, it says what it needs to say.

Like *WordStar* Classic, *My Word!* doesn't show much text formatting onscreen. Instead, it shows text surrounded by oddball characters in place of underline, boldface, italic, and so on. MailMerge and more complex formatting require the use of dot commands, which will gladden the hearts of *WordStar* or UNIX users like me but may frustrate the word processing novice.

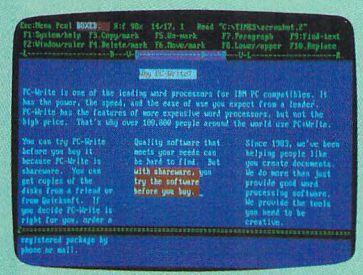
I was unhappy with a few things. *My Word!* carries forth *WordStar* Classic's unfortunate use of the Del key to delete the character to the right of the cursor. The spell-checker is a bit clunky, and the system all but requires a hard disk. The function keys are too restrictive: They aren't redefinable (only F1–F10 are active), and there is no way to put the shifted function keys to work. Macro keys are limited to the ten not-terribly-mnemonic keys from Alt-0 through Alt-9. Finally, escaping from actions is possible in most cases only by using *WordStar* Classic's Ctrl-U key combination rather than the more common Esc key.

Printer control isn't much better than *WordStar*'s, so forget kerning, PostScript or LaserJet soft fonts, or support of any but the most popular printers. Finally, document size is limited to available memory, whereas *WordStar* Classic could manage a document as large as the disk. This is seldom a problem, but if words are your business, as they are mine, it's worth knowing.

So, if you liked *WordStar* Classic, you'll love *My Word!*. It gives you uncompromising power, tremendous speed, and quite a few extras at a bargain-basement price. If, however, you're shopping for your first word processor at a similar price and you value ease of learning or a WYSIWYG display over a long features list, you'll be better served by one of the other word processors covered in this roundup.

— *Tom Campbell*

PC-Write 2.0



"PC-Write is a complete and complex program. It comes with a wealth of features you wouldn't expect to find in a bargain word processor."

Quicksoft
219 First Ave. N, #224
Seattle, WA 98109
(206) 282-0452
$89.00

It would be difficult to ask for more word processor than Quicksoft provides with its shareware program, *PC-Write* 3.0. First, since it's shareware, you can use the software before you pay for it. Second, *PC-Write* meets my criteria for home computer soft-

ware: It's not copy protected and it costs less than $100 (full registration costs only $89 and comes with a hardbound manual, telephone support, limited free updates, and other useful features).

PC-Write is a complete and complex program. It comes with a wealth of features you wouldn't expect to find in a bargain word processor, including mouse support for cursor movement and operation selection, multiple columns, font mixing, automatic creation of tables of contents and indexes, footnotes, an automatic speller, word count, and support for over 500 printers (including laser printers). *PC-Write* communicates with my printer better than any software I have ever used.

Beginners may be intimidated by the number of commands available with *PC-Write:* There are 13 menus, 62 dot commands, 70 control-file switches, five cursor shapes, and over 200 keyboard command sequences. But all of this complexity is mitigated by the 45 help screens available from within the program and the excellent, indexed manual. In addition, a beginner can ignore much of the complexity because the default settings are adequate to begin producing documents. The more complex commands can be learned as required.

The setup program for *PC-Write* 3.0 is one of the best I've seen. The user is asked a series of yes/no questions, including one about the type of storage media to be used. *PC-Write* automatically sets up the working disk or disks and the edit control file based upon your answers.

On the downside, *PC-Write* 3.0 is not a WYSIWYG (What You See Is What You Get) word processor, it doesn't use pull-down menus, and it requires the user to describe many document attributes. Text-formatting commands (such as Alt-G .M:2 to double-space a document) are entered in the edit file and interpreted by the printer program, but they are not displayed on the screen. Commands that should have default settings (such as side, top, and bot-

Other Word Processors Priced at Under $100

Bank Street Writer Plus
Brøderbund
17 Paul Dr.
San Rafael, CA 94903-2101
$79.95

BetterWorking WordProcessor, Version 1.12
Spinnaker
One Kendall Square
Cambridge, MA 02139
$29.95

Dac Easy Word III
Dac Software
17950 Preston Rd.
Suite 800
Dallas, TX 75252
$69.95

Easy Extra, Version 1.5
MicroPro International
33 San Pablo Ave.
San Rafael, CA 94903
$99.00

Einstein Writer, Version 8.2
Perceptronics
Distributed by Preface, User Interface Design
6815 Whitsett Ave.
Suite 10
N. Hollywood, CA 91605
$75.00

Executive Footnoter, Version 6.0
John Risken & Associates
P.O. Box 24045
Minneapolis, MN 55424
$69.95

Executive Writer, Version 1.0
Paperback Software International
2830 Ninth St.
Berkeley, CA 94710
$69.95

FriendlyWare Writer/Speller, Version 3.4
FriendlySoft
3638 West Pioneer Pkwy.
Arlington, TX 76013
$89.95

Galaxy, Version 2.42
OmniVerse
P.O. Box 2974
Renton, WA 98056-0961
$59.95

Microsoft Windows Write
(Comes with Microsoft Windows 286, version 2.1)
Microsoft
16011 NE 36th Way
Box 97017
Redmond, WA 98073-9717
$99.00

MindReader, Version 2.3
Brown Bag Software
2155 S. Bascom Ave.
Suite 114
Campbell, CA 95008
$89.95

New York Word, Version 2.3
Magma Software Systems
15 Bodwell Terr.
Millburn, NJ 07041
$45.00

Paperback Writer, Version 1.0
Paperback Software International
2830 Ninth St.
Berkeley, CA 94710
$39.95

PC-Type Plus, Version 1.0
ButtonWare
P.O. Box 96058
Bellevue, WA 98009-4469
$69.95

QWP
HFK Software
68 Wells Rd.
Lincoln, MA 01773
$99.00

Volkswriter Deluxe Plus, Version 1.0
Lifetree Software
411 Pacific St.
Monterey, CA 93940
$99.00

Webster's NewWorld Writer, Version 1.0
Simon & Schuster Software
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$1.95 Per Disk Ten or More

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PC-Write 3.01 (3610–3612)—All the features you could need including spell-checking. The BEST word processor under $200! (3 disks)

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WAMPUM (3220)—An excellent dBASE compatible package which can be used as a development tool or end-user dBASE management system. (Requires hard disk!)

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French I & II (3500, 3501)—French vocabulary and verb drills for beginning–intermediate students. (2 disks)

Spanish I & II (3505, 3506)—Spanish vocabulary for students and travelers. (2 disks)

Japanese (3510)—Designed for the business traveler, but excellent for students, too.

German I & II (3512, 3513)—German vocabulary practice and instruction. (2 disks)

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Geography (3526)—Make learning fun with this geography trivia game.

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Lotus Learning System (3556, 3557)—A very complete package that makes Lotus 1-2-3 easier and more interesting. (2 disks)

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UTILITIES

Masterkeys (3300)—Like the popular Norton disk utilities, only better!

SimCGA & HGIBM (3305)—Allows you to run many programs that require a color graphics adapter on a monochrome system.

Vaccines (3307)—Ten virus checker/eliminator and protection utilities.

PC-DeskTeam (3375)—Large collection of "Sidekick-Like" desktop accessories.

HDMenu (3379)—Puts all the programs on your hard disk into an auto-booting, one-touch menu! Has security features. (Easy installation!)

On-Side (3387)—Print your spreadsheets (or anything) sideways!

Q-Modem (3700–3703)—A professional modem telecommunications package which is both versatile and easy to use. (4 disks)

RELIGION/BIBLE

BIBLE-Q (3552)—Test your Biblical IQ.

BIBLE Men (3565)—Choose the Old or New Testament and prepare to be quizzed about the different people mentioned in the BIBLE.

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(CGA)=requires color graphics card

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Requires EGA graphics card!

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EGA TREK (3481)—You command the Enterprise in the ultimate Star Trek adventure. (EGA)

EGA Golf (3482)—A challenging golf game with beautiful graphics! (EGA)

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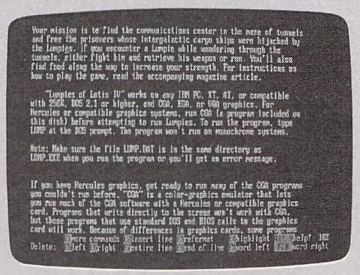
tom margins) must be explicitly described. Several layers of menus must be traversed to implement some seemingly simple operations (such as printing a file). But this is the price you pay for *PC-Write*'s versatility, and many users won't see these as negatives, but will consider them desirable options, instead.

For the price, features, and the try-before-you-buy option, you can't beat *PC-Write* 3.0.

— *James Maki*

Textra 5.2



"Textra works—and it works well. For its price, it really is a superb deal."

Ann Arbor Software
345 S. Division
Ann Arbor, MI 48104
(800) 345-6777
$69.95 (price includes next major upgrade; 60-day free trial available)

The best thing you can say about any productivity program is that you actually use it. In the case of Ann Arbor Software's *Textra,* I can go this one better: I not only use it; I use it often.

Why? First off, it has all the features you'd expect of a word processor: block operations, basic editing functions, save and restore, and online help. It has a solid spelling checker, and it contains drivers for over 100 printers. It has an excellent document-retrieval system, and it even offers several tutorial "films" to help you get started with the program and then begin using its more advanced features.

Beyond these good (if expected) features, though, *Textra* offers far more features. The most important of these are its page-preview system, its online style guide, and its superb ease of customization. Accept my word, if you will, that the package performs the usual word processing functions quickly and (for the most part) easily, and let's discuss these special features instead.

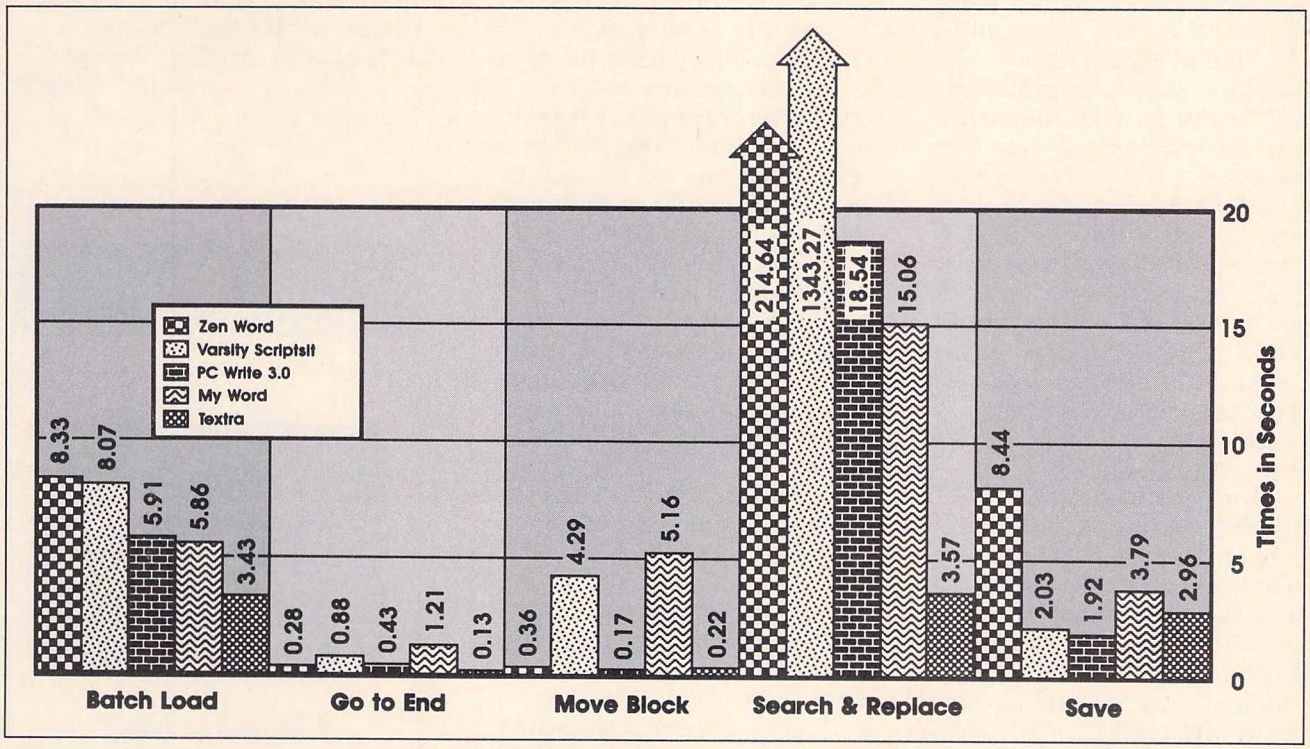
Textra's Print command (accessible, like all commands, from a menu line or by keystroke command) offers a page preview option. As you would expect, this lets you see what your page will look like when it's printed. Less expected, though, is its usefulness. Available here are Text view, Full Page view, Document view, and Page Break view. The first just shows the normal screen view, but the other three are much more impressive. Page Break view shows you the bottom of the current page and the top of the next, as well as showing both full pages in a much-reduced image beside them. Document view yields a reduced image of six pages across the screen, letting you see what they look like without your actually being able to read them. Full Page view gives a print view of the full current page, complete with headers, footers, and page numbers, and the type on the page is readable. Formatting your pages was never easier.

The Style Guide is nothing short of excellent. Pressing Alt-F4 brings up the Guide's table of contents, with topics such as punctuation, abbreviations, capitalization, bibliographies, and footnotes. Pressing the key for the topic you want yields a submenu with more specific topics; Bibliography, for instance, has 12 items here, ranging from general information to the proper method of citing nonprinted sources. You simply choose the item you want, and the program responds with information about that item. It's useful, quick, easy, and indispensable.

Finally, *Textra* is highly customizable. The Miscellaneous Switches menu allows you to choose whether or not you want automatic backup of documents (and how many minutes between these backups), whether or not to have the paragraphs automatically indented, the letter of your default data drive, the use of block-marking shortcuts, and so on. Inside this menu are two submenus, one for customizing the editing menu and one for hardware configuration. The former lets you choose the number of lines in the command menu at the bottom of the text screen (that is, whether you want all, some, or none of it there), how you want the page and line information displayed on the screen (or if you want it off), and where you want the ruler bar (or, again, if you want it at all). The Hardware Configuration submenu lets you speed up or slow down the keyboard for various purposes (PgUp, cursor speed, and so on), modify the look of the cursor, and change text, background, and special-effects colors in practically any conceivable combination.

Textra isn't perfect. It has no macro system, and it has no facility for creating footnotes, indexes, or tables of contents. It even has two annoying features: If you edit text, it doesn't automatically reformat the paragraph (you must press F3); and you must either double-space between paragraphs or press Ctrl-P to start a new one on the immediately following line. But Ann Arbor Software has a history of upgrading *Textra,* so the annoyances will surely be ironed out. The additional features, meanwhile, are unnecessary for many users, so their omission is possibly quite unimportant. What *is* important is that *Textra* works—and it works well. For its price, it really is a superb deal.

— *Neil Randall* ▷



Benchmarks

To test our five word processors, we devised five common tasks and timed them on a HeadStart Turbo-888-XT (running at its faster turbo speed) with 640K and a hard drive. We used a 20K test file consisting entirely of *aaa*'s. Each test was performed ten times, and we averaged the results to reduce the margin of error.

▶ The *Batch Load* test measured the time it took for the program and text file to load from the DOS prompt. (Each of the programs allows you to type the program and filename together at the DOS prompt in order to combine the two actions into a single command.)

▶ The *Go to the End* test determined how long it took to move the cursor from the beginning of the 20K test file to the end.

▶ The *Move Block* test measured the time it took a program to move ten lines of 15 *aaa*'s from the beginning of the 20K test file to the end. (With *Varsity Scriptsit,* two separate operations—Copy to Buffer and Paste to Document—were necessary to complete the block move. The two times were added together for a composite number.)

▶ The *Global Search and Replace* test measured how long it took a word processor to replace each of the 5,036 *aaa*'s in the 20K test file with *bbb*'s. (We chose to replace a large number of items in order to highlight any significant differences. The results were pretty dramatic. This test brought the widest variation, with the shortest time being 3.57 seconds, for *Textra,* and the longest time being 1343.27 seconds, for *Varsity Scripsit.* Fortunately, you'll probably never have to replace 5000 items at a time.)

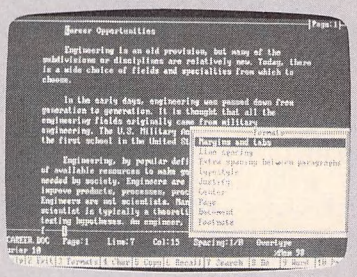
▶ The *Save Test File* test determined the time it took to save the test file, exit the word processor, and return to the DOS prompt.

Take these figures with a large grain of salt, especially the shortest times, where the human element is more of a factor (for shorter times, the human reaction time is a larger proportion of the total measurement).

More importantly, consider how you'll use the word processor and how much of your time will really be spent performing these tasks. (If you don't normally do block moves, those numbers shouldn't be important to you.)

Also, please note that if your computer runs faster or slower than our test computer, your times will vary accordingly.

Varsity Scripsit



"Varsity is a word processor priced like a bargain system, but it's packed with powerful features, some of which compare with those of high-end products."

Tandy
1800 One Tandy Center
Fort Worth, TX 76102
$89.95

BEST-KEPT SECRETS

Five Word Processors Priced at Under $100

If you're looking for a word processor with advanced features at a cheery price, Tandy's *Varsity Scripsit* may be just the tool for you. *Varsity* is a word processor priced like a bargain system, but it's packed with powerful features, some of which compare with those of high-end products. That's not to say that *Varsity* has the facility, functions, and features of a word processor like *WordPerfect* 5.0 or *WordStar Professional*. It simply does not. But when you look at what you get for the price, *Varsity Scripsit* is well worth considering.

Varsity comes on four 5¼-inch disks or one 3½-inch disk (both are provided). A spiral-bound help manual of nearly 300 pages and a solid tutorial enable you to learn the features systematically. *Varsity* uses function keys 1–10 by themselves and in combination with the Shift, Ctrl, and Alt keys. Sensible labels at the bottom of the screen identify each key's function. Abundant pop-up menus and dialog boxes make command choice easy. And if you have particular strings of keystrokes that you repeatedly use, *Varsity*'s macro keys can handle even your most exotic sequences.

My one considered complaint with *Varsity* is the speed of its Houghton Mifflin speller. Compared with state-of-the-art spelling checkers—say, the snappy thesaurus/speller in *Webster's NewWorld Combo* or the spitfire system packaged with *WordStar Professional* or *WordStar 2000*—this verifier moves like a glacier.

As if to balance its slow spell-checking, *Varsity* has a list of excellent features that include context-sensitive online help, indexing, mail merging, marker cross referencing, and a command that lets you print a larger document than will fit in memory.

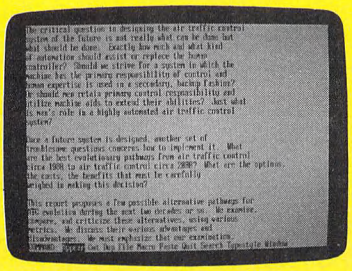
One of *Varsity*'s nicest features is that it lets you edit multiple documents using split windows (vertical or horizontal), a feature that I've grown to depend upon. It can also take care of automatic footnotes or endnotes, tables of contents and key words, automatic reformatting, and left-margin cascading (for outlined text). This software also lets you convert files from *Varsity* to ASCII format and vice versa, a handy feature when you're preparing files for modem transmission or converting files from another processor.

As in other new-generation processors, you can choose whether to hide or view embedded codes and print commands. Printer type styles can be changed easily by words, lines, or paragraphs. If you want to change a double-spaced draft to single spacing, *Varsity* automatically inserts a line between the paragraphs at your option. If you type extremely fast, *Varsity* may expedite things by switching from Insert mode to Open mode, then it reforms paragraphs and paginates only when your fingers take a break.

After all's said and done, a versatile word processing system that's kind to your wallet is always worth noting. If you're interested in bang for the buck, *Varsity Scripsit* is an excellent choice.

— Bob Gingher

Zen Word



"If your text-processing needs are basic, Zen Word's simplicity, clarity, speed, and breadth of features make it an investment worth considering."

Wesson International
1439 Circle Ridge
Austin, TX 78746
(512) 328-0100
$39.95

Fast Features: Five Word Processors Priced at Under $100

Product	*My Word!*, Version 2.22	*PC-Write* 3.0	*Textra* 5.2	*Varsity Scripsit*	*Zen Word*, Version 3.0
Company	TNT Software	Quicksoft	Ann Arbor Software	Tandy	Wesson International
Price	$49.00 ($59.00 with spelling checker)	$89.00	$69.95	$89.95	$39.95
System Requirements	384K, DOS 3.1 or higher	448K suggested	256K	256K, 384K recommended	128K
Maximum File Size	Available RAM	Available RAM	60K	64K	Unlimited
Number of Windows	1	2	1	2	1
Words in Dictionary	62,000	50,000	80,000	82,000	90,000
Automatic Reformat	○	●	○	●	○
Hyphenation	○	○	○	●	○
Footnotes	○	●	○	●	○
Macros	●	●	○	●	●
Math	●	○	○	○	○
Mail Merge	●	●	○	●	●
Number of Printer Drivers	4	500	200	56	44

No one expects inexpensive software to be both easy to use *and* agile, but that's what makes *Zen Word* special. Menus make the program easy to use: You execute every function by selecting it from one of several menus. Esc brings up the menu bar at the bottom of the screen, and one or two more keystrokes invoke the particular operation. There aren't any shortcuts, but there are no hot-key commands to memorize, either.

Yet the menus never get in the way. When you type a familiar selection sequence quickly enough, the program won't stop to display the menus you're using. Only when you hesitate does a menu show up to help you along. And if you get stuck, you can always pop up a help screen to explain each menu choice almost as thoroughly as the program's concise, clearly written manual does.

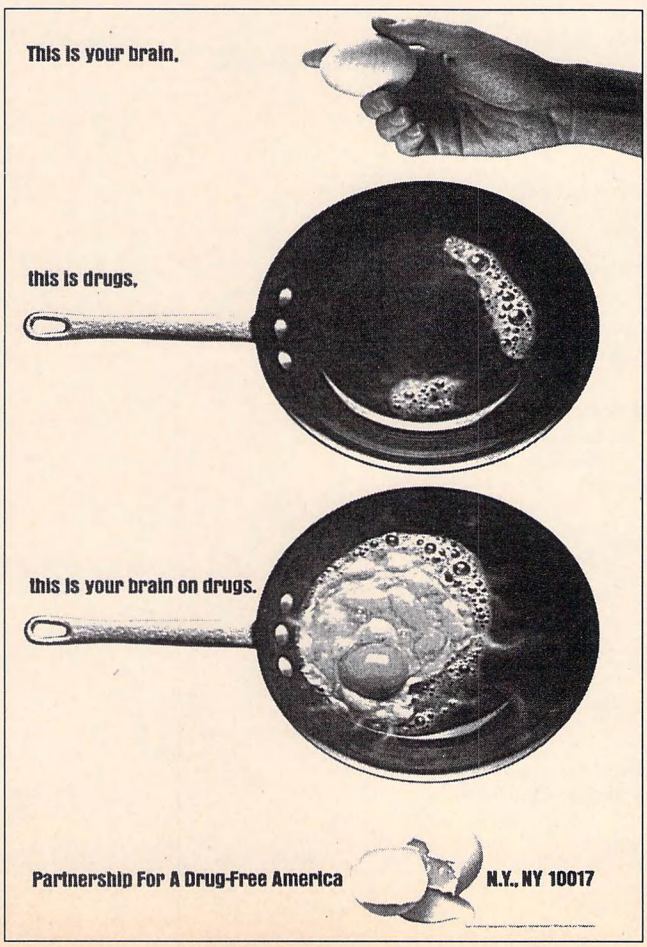
Zen Word has a full plate of text-processing features. A well-chosen set of cursor-movement commands makes finding your way around a document fast and convenient. Its global search-and-replace functions are swift. Block operations let you cut and paste, as well as copy and reformat, selected parts of your text. You can split the screen to display and edit two documents at once and move text between the two. A limited macro capability lets you record up to ten frequently used keystroke sequences, including both menu selections and text, and assign them to function keys.

File operations include options to save files automatically and maintain automatic file backups. You can save files either in the program's own format, which holds information about the document's and the program's configuration, or as pure ASCII text files. You also get a basic line-drawing capability, using the IBM extended character set, and an adequate spelling checker that you can use both from within the program and as a stand-alone utility.

Zen Word's most serious limitation comes from the fact that it is, at its core, a line-oriented text editor. The program doesn't automatically reformat text, and when you call for reformatting, it only respects paragraph breaks if you're willing to put a blank line between each of them.

Finally, *Zen Word's* printer interface is better than you'd expect in an inexpensive program. It comes with specific drivers for more than 40 popular printers. While the drivers support only six functions of each printer, you can easily change them and pick the specific features of your printer that you want to use. If your text-processing needs are basic, *Zen Word's* simplicity, clarity, speed, and breadth of features make it an investment worth considering.

— *Harry Bee*



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SPECIAL REPORT

SPA Excellence in Software Awards, 1988

After months of suspense, the Software Publisher's Association has announced the winners of its SPA Excellence in Software Awards for 1988. At the black-tie gala, held this past May in San Diego, more than one thousand industry watchers waited anxiously to find out if their favorites were among the winners. How many of the programs in the list below would you have voted for? (Winners are available for the PC except where noted.)

Consumer Software Awards

- Best Entertainment Program: *Tetris* (Spectrum HoloByte)
- Best Personal Productivity Program: *Quicken* (Intuit)
- Best Creativity Program for a Consumer Product: *Digital Darkroom,* for the Macintosh (Silicon Beach Software)
- Best Sound Achievement in a Non-Music Product: *The Three Stooges,* for the Amiga (Cinemaware)
- Best Graphics Achievement in a Non-Graphics Product: *Battle Chess* (Interplay Productions)
- Best Graphics in a Graphics Product: *Adobe Illustrator 88,* for the Macintosh (Adobe Systems)
- Best Original Game Achievement: *Tetris* (Spectrum HoloByte)
- Best Sports: *Wayne Gretzky Hockey,* for the Amiga (Bethesda Softworks)
- Best Action/Arcade: *Shufflepuck Cafe,* for the Macintosh (Brøderbund)
- Best Simulation Program: *F-19 Stealth Fighter* (MicroProse)
- Best Action/Strategy Program: *Tetris* (Spectrum HoloByte)
- Best Adventure/Fantasy/Role-Playing Program: *King's Quest IV—The Perils of Rosella* (Sierra On-Line)
- Critic's Choice—Best Consumer Software Program: *Tetris* (Spectrum HoloByte)

Business Software Awards

- Best Entry Level Business Application: *Quicken* (Intuit)
- Best Power Business Application: *FoxBASE+* (Fox Software)
- Best Vertical Market Application: *MacInTax/TaxView 1988* (SoftView)
- Best Business Application: Word or Text Orientation: *WordPerfect* 5.0 (WordPerfect)
- Best Business Application: Graphic or Display Orientation: *Adobe Illustrator 88,* for the Macintosh (Adobe Systems)
- Best Business Application: Numeric or Data Orientation: *Q & A* 3.0 (Symantec)
- Best Business Utility or Accessory: *Allways, The Spreadsheet Publisher* (Funk Software)
- Best New Business Use of a Computer: *IZE* (Persoft)
- Best Multifunctional Program: *Q & A* 3.0 (Symantec)
- Best Graphical User Interface Design in a Business Program: HP New Wave (Hewlett-Packard)
- Best Multi-User Product: *Q & A* 3.0 (Symantec)
- Best Product for Managers: *GrandView* (Symantec)
- Critic's Choice—Best Business Software Program: *Lotus Agenda* (Lotus Development)

Education Software Awards

- Best Early Education Program: *The New Talking Stickybear Alphabet,* for the Apple IIGS (Weekly Reader Software/Optimum Resource)
- Best Elementary School Program: *NumberMaze,* for the Macintosh (Great Wave Software)
- Best Junior High/High School Program: *Calculus* (Brøderbund)
- Best Home Learning Program: *Where in Europe Is Carmen Sandiego?* (Brøderbund)
- Best Productivity Program: *Wordbench, The Tool for People Who Write* (Addison-Wesley)
- Best Creativity Program for an Educational Product: *Hometown U.S.A.* (Publishing International)
- Best Math Program: *NumberMaze,* for the Macintosh (Great Wave Software)
- Best Language Arts Program: *Voy a Leer Escribiendo*
- Best Social Studies/Science Program: *Where in Europe Is Carmen Sandiego?* (Brøderbund)
- Best Special Education Program: *Word and Concept* (Laureate Learning Systems)
- Critic's Choice—Best Education Software: *World GeoGraph* (MECC)

Technical Awards

- Best Programming Language or Tool: *THINK's Lightspeed C* 3.0, for the Macintosh (Symantec)
- Best Utility: *The Norton Utilities Advanced Edition* 4.5 (Peter Norton Computing)
- Best Technical Achievement: *The Norton Utilities Advanced Edition* 4.5 (Peter Norton Computing)

General Awards

- Best New Use of a Computer: *The Manhole,* for the Macintosh (Activision Entertainment/Mediagenic)
- Best Telecommunications Software: *CompuServe Navigator,* for the Macintosh (CompuServe)
- Best LAN Software: *Microsoft OS/2 LAN Manager* (Microsoft)
- Best of the Best: *Adobe Illustrator 88,* for the Macintosh (Adobe Systems)

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BACK ISSUES

Note:

- *Selected titles are listed under contents for each issue*
- *3½-inch disks available for some issues*
- *Programs requiring more than 256K or a color monitor are so noted*

January 1988, Issue 3, Vol. 2, No. 1

Features

Trapping Disk Errors in Turbo Pascal: Cut debugging time in half
A Winter's Tale: *Flight Simulator* adventure

Software on Disk

PC-Art: Full-featured drawing (CGA or EGA)
EZDOS: Powerful DOS enhancer
RoboKey: Teach your PC to execute commands
Wrimage: Educational word game (CGA)
Keyboard Lock-Out: Secure your computer
Burger Blaster: Zap flying hamburgers (CGA)

March 1988, Issue 4, Vol. 2, No. 2

Feature

Flying Home: *Flight Simulator* adventure

Software on Disk

TheDraw: Design custom menu screens, presentations, or animated sequences
Tonto!: Pop-up with ASCII chart, clock/calendar, directory, hex converter, keyboard scan code reader, and printer setup
Font Typesetter: New fonts for your printer (CGA)
Designing Custom Fonts: Create your own fonts for Font Typesetter (CGA)
FileFinder: Locate any file, in any directory
SuperTiler: More power for BASIC's PAINT (CGA)
Hover: Futuristic tennis game (CGA)
DOS Help: Help screens for DOS commands

May 1988, Issue 5, Vol. 2, No. 3

Feature

Advanced Spreadsheets: Special techniques for power tools

Software on Disk

Quick Scheduler: Organize yourself!
Source Code XREF: Debugging made easy
Text File Compare: Find out which file is which
WHOA!: Control your PC's speed (EGA not supported)
Las Vegas Solitaire: Solitaire with casino rules
States & Capitals: Learn U.S. geography and have some fun (CGA)
QikServe: Arcade fun in a fast-food setting (CGA)

July 1988, Issue 6, Vol. 2, No. 4

Features

How to Build Your Own PC Clone: Expert advice on a money-saving alternative
In Praise of PC Play: PC blasts into the game market
Talking to Your Printer: Make your printer do all its tricks
Buyer's Guide to Simulation Software: 38 exciting games put you in command

Software on Disk

JLSCAN: Super file lister
Presentation Graphics: Create professional-looking graphs and charts (CGA)

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File-It: Save text screens to disk
Graphics Shape Editor: Design your own graphics for games (CGA)
Ancient Empires: The glory of battles past (CGA)
Power Poker: An old favorite with a new twist

September 1988, Issue 7, Vol. 2, No. 5

Features

IBM Shakes Apple's Tree: PCs invade the classroom
How to Install a 3½-Inch Drive: A few household tools and half an hour are all you need
CD-ROM—New Horizons for PC Users: CD-ROMs become a viable storage medium
DeskMate—Windows for the Rest of Us?: Hands-on guide to Tandy's new operating environment
Buyer's Guide to Software for Teachers and Coaches: 29 packages to help any school's staff

Software on Disk

Ample Notice: Never miss an appointment (512K)
Three-Dimensional Shapes: Create, view, and move 3-D objects (CGA)
Arcade Baseball: Electronic version of America's favorite pastime (CGA or EGA)
Stream Search: Find that string!
Screen Editor: Create eye-catching screens for batch files or BASIC (CGA)

November 1988, Issue 8, Vol. 2, No. 6

Features

How to Organize Your Hard Disk: Easy-to-use DOS commands to fine-tune your hard disk
Top 10 Tools for Your PC: Software our editors like and why
Hard Disk Utilities—Getting Started: Introduction to essential utilities
PC-Link—A Quantum Leap: New telecommunications service for PC users only
Buyer's Guide to Disk Performance Software: 21 comprehensive packages, caches, and optimizers

Software on Disk

MealMaster: Menu-driven recipe database
Programmable Printer Popup: Maximize your printer's performance
TimePark: Insurance against hard disk disaster
Ultima21: Blackjack with a twist
Stars: Interactive star chart (CGA)
SolarPix: See the solar system in motion (CGA)

January 1989, Issue 9, Vol. 3, No. 1

Features

Upgrading to an AT-Class PC for Less Than $400: Move into the fast lane
Do Your Taxes with Your Spreadsheet: Let your spreadsheet do the work
A Close-Up Look at DOS 4.0: Hands-on tour of IBM's new operating system
Buyer's Guide—Financial Management: 59 programs to manage your assets

Software on Disk

Pro Football: Coach your own team to a season championship (CGA)
Bounty Hunter: The chase is on! Find the crook . . . and learn U.S. geography
Disk Navigator: Sail through disk management
Stack: Recall any command, anytime
Move: Make your files go where you want them to
Off Road: Blast through Baja in a 4 × 4 (CGA)
Sled: Fast, powerful text editor
Flush: Send TSRs packing

March 1989, Issue 10, Vol. 3, No. 2

Features

Laser Power from Your Dot-Matrix Printer: Supercharge your 9-pin printer
RAM Charge! How to Expand Your PC's Memory: Everything you need to know
Buyer's Guide to Expanded Memory Boards: 83 memory boards for more RAM power

Software on Disk

Arcade Volleyball: Electrifying on-court action
Spin 'n' Print: Print spreadsheets sideways (CGA)
HDtest: Tune up your hard disk
Cribbage: The game of kings and queens
FixBeep: Control your PC's speaker
ColorSet: Choose your own screen palette (CGA)

May 1989, Issue 11, Vol. 3, No. 3

Features

Game Designers' Favorite PC Games: Five pros pick their favorites
How to Install a Hard Disk: It's as easy as 1-2-3
Future Games: Put your imagination into overdrive
Buyer's Guide to Sports Games: 62 super diversions

Software on Disk

Iskib: Save the planet from hostile aliens (CGA)
Dr. Sleeptite and the Nightmare Factory: Foil the villain and destroy his Dream Machine (CGA)
Block Out: Fast-paced strategy for the whole family (CGA or EGA)
Vmusic: Compose and play three-part music
Rich Levin's Checkup: Defend your system against virus attack
SearchIn: Find the text you want—fast!
Subdir: Soar through directories
Snooper: Uncover messages hidden in program files

July 1989, Issue 12, Vol. 3, No. 4

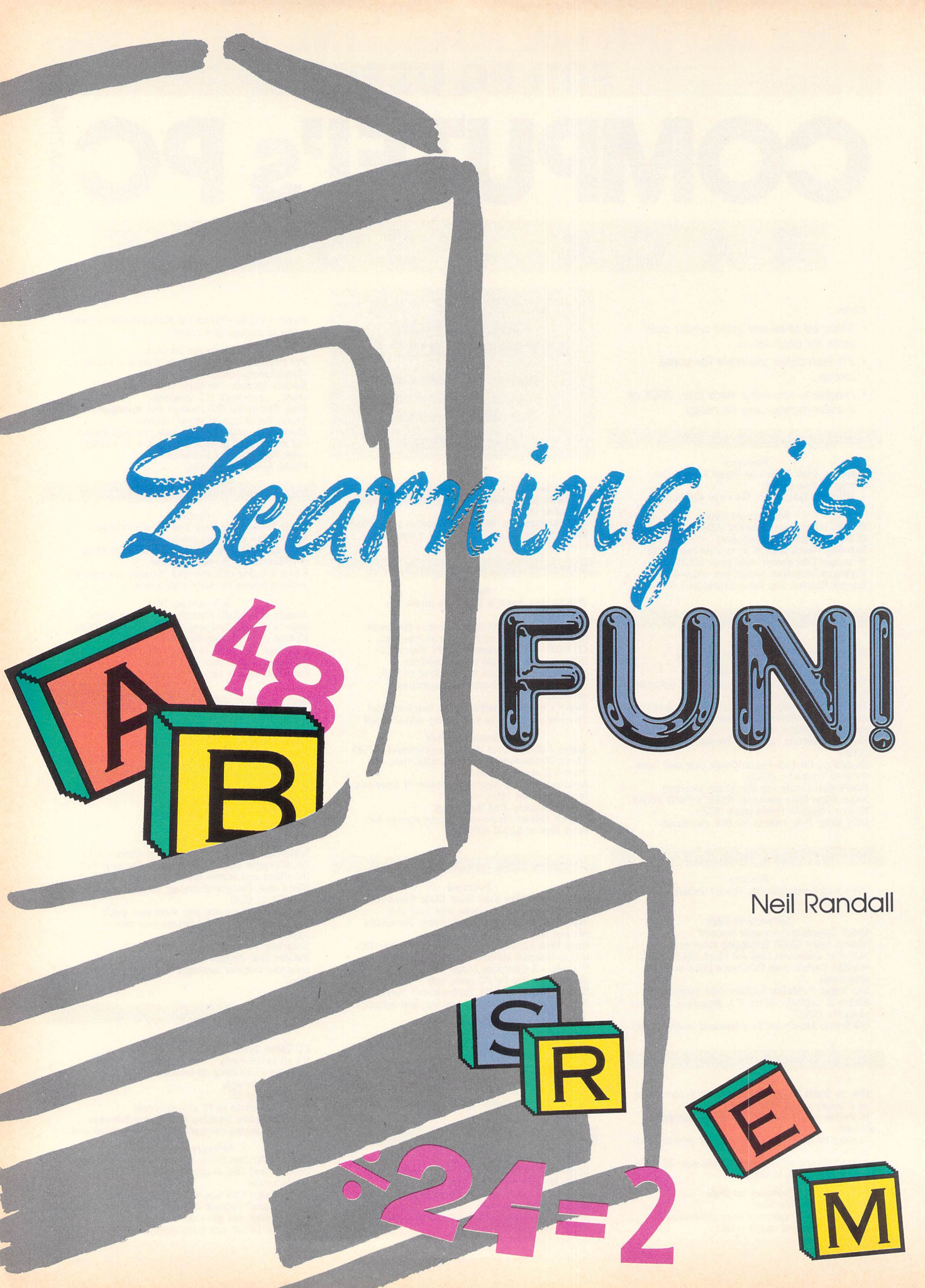
Features

PC Video Systems Made Easy: It's all in the cards
Desktop Publishing Revolution: Get started in style
King's Quest IV: A new dimension in PC entertainment
Buyer's Guide: Desktop Publishing Software 50 hot publishing packages; 101 clip-art collections

Software on Disk

TurboTYPE: Kiss DOS's TYPE command good-bye
CGA: At last! CGA programs on your monochrome graphics card
Menu-Matic: One keypress runs any program
Nifty James' Famous Utilities: Zap backups, calculate online, and get a quote for the day
PrtLabel: Design and print custom labels

FOR ORDER INFORMATION AND FORM, SEE PAGE 72.



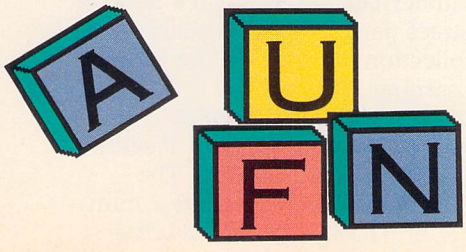
Neil Randall

Getting ready for school? Don't forget the computer! With the right software, students from kindergarten through college can master important skills and have fun at the same time.

We all began somewhere. For me, it was six years ago, with a Commodore 64 and a word processing package. For others, it was an Apple II in the classroom. For still others, the start was with an unfriendly mainframe.

Increasingly, though, the starter computer is an IBM compatible. MS-DOS machines have almost completely rid themselves of the distinction of being expensive business computers, and some have even become inexpensive home computers. This means you can take your *WordPerfect, Lotus 1-2-3, dBase IV,* or *Ventura* files home from the office with you.

But it means one other thing as well. Your children will want to use your PC, and you have the responsibility of starting them off with the best possible software. Software that lets them produce but which won't intimidate. Software that teaches them but which doesn't bore. Software that entertains but which doesn't throw them into a world of mindless joysticking.



Software, in other words, that seems impossible to find.

It isn't, though. The home computer revolution has been nothing if not varied, and that variety extends to software as well as hardware. Yes, there are many dull educational packages on the store shelves and just as many productivity packages that require an astounding amount of computer knowledge. And, yes, badly designed, violence-oriented arcade games are still produced with seeming abandon.

But there's also a core of software, expertly designed and executed, that meets the needs of those who want to start preschool children or students off on the right foot. Emphasizing learning but not at the expense of entertainment, this software operates according to Horace's millennia-old philosophy of art: that it must both instruct and delight.

Hot Spots

Every piece of startup software needs to have certain key elements. The following list covers the basics:

Graphics Appeal. Yes, graphics are vital. And the better they are, the more attractive the software. For preschoolers and kindergartners, software without graphics is completely unusable, while for older children it's simply unappealing. If there's one axiom in self-learning software, it's this: Make it attractive or don't make it at all.

Usability. One of the buzzwords in current research into software, usability applies to both the program and the documentation. What it means is this: The package must show evidence that the designers considered precisely how people will actually use the software.

As an example, many MS-DOS manuals begin with the installation instructions, and these are hopelessly intimidating to the inexperienced user. Similarly unusable are many of the startup instructions that appear on the screen. Worse still are systems-oriented error messages that show up in the middle of some programs.

Educational Value. When most people think of buying a computer for the family, they think of its educational value. But what does this mean? If it means helping a child (of whatever age) with specific subjects in school, that's one thing. But a good program can teach much more than this. Of perhaps greater educational value is the program's ability to teach what is *not* in the curriculum, to introduce the child to something completely new. Combine this with the computer's ability to concentrate on topics the child considers relevant and you have an extremely powerful educational device.

Learning is FUN!

Entertainment Value. If a good program both instructs and delights, entertainment value represents the "delight" side. And, yes, it's important, even if the primary goal is education. Gone are the days when education was considered all work and no play.

Cultural Value. This is difficult to determine, but it has to do with how well you feel the program reflects the life values you want your computer novice to have. If an arcade-style program teaches math concepts while it simultaneously teaches the mindless destruction of alien life, you might well decide that its bad points outweigh its good points. Other programs might provide an excellent background to what it's like to be rich and decadent, but this could easily be knowledge that you don't want your children to have.

Get Started

All software is educational. Arcade games teach hand-eye coordination, while text-only math drills teach math facts. Your MS-DOS system disk teaches something important about computers: Simply by not putting it in the disk drive, you find out that computers need systems software.

Not all software, however, is suitable for beginners. *Lotus 1-2-3* or *dBase IV*, whatever their excellence as business packages, can intimidate new users and perhaps drive them away from the computer altogether. Ditto for programming languages such as C or Pascal. Nor is a hard disk backup utility the place to start, and even many complex games can leave the novice cold.

On the other hand, too little complexity can do just as much harm. Many educational packages make the mistake of not asking enough of the user, with the result that boredom quickly sets in. Some word processors, designed as a child's first text editor, are insultingly underfeatured. And the software world is filled with games that simply do not challenge.

Given these caveats, plus the guidelines specified above, we can isolate four types of software appropriate as startup packages. The first is billed as *educational software*. This includes courseware, tutorials, and drill-type material. Second, we have *simulations*. This is a huge body of software and includes everything from stock-market models to flight simulators. The third type is *games*, ranging from semihistorical adventure games to role-playing games. These teach in a significantly different way. Finally, we have *applications*, which are less educational than useful.

It's an Education

I remember showing a software package to my friend's 12-year-old son. He took it eagerly, looked at the back, and seemed instantly disappointed. Handing it back to me, he said, "If it says *educational*, it's sure to be a dog."

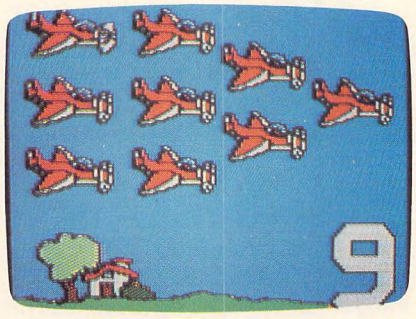
Again and again, I've heard this reaction to products billed as educational software. Many young people, after using educational software in school, want nothing to do with it at home. Their distaste is often warranted; just because software fits a curriculum doesn't mean it's worthwhile.

But much software is. The best packages recognize that students must be motivated to learn and that merely putting course material on a computer isn't a guarantee that it will teach. A number of software companies—Mindscape, Spinnaker, Optimum Resource, Unicorn, First Byte, and Sunburst among them—have captured a share of the market by trying to merge the interests of the teacher with those of the student.

The result is a great deal of excellent startup software. To return once more to our dictum, its goal is clearly both to instruct and to delight.

The Beginning

There's a treasure-trove of software for preschoolers. Hi Tech Expressions markets a line of Sesame Street software, with many of the titles oriented toward children 3–6 years of age. *Big Bird's Special Delivery* uses the famous bird to help children see matching patterns, while *Astro-Grover* uses



Stickybear Numbers *uses interesting characters and stories to teach counting and arithmetic skills to preschool-age children.*

Grover to help them learn counting and arithmetic skills. Grover reappears in *Grover's Animal Adventures*, in which the child visits several environments to learn about the native animals. Ernie stars in a couple of packages: a shape-matching game called *Ernie's Magic Shapes* and a fascinating problem-solving program named *Ernie's Big Splash*. In the latter, the child uses planning skills to build a pathway to get to Rubber Duckie. Hi Tech's Sesame Street packages are available as collections in the Sesame Street Learning Libraries.

An extremely popular children's series comes from Weekly Reader Family Software. The Stickybear family inhabits a number of packages, with *Stickybear*

Numbers designed for the three- to six-year-old crowd. In these packages, Stickybear and his friends teach children a number of curriculum-oriented skills, and *Stickybear Numbers* concentrates on early counting skills. Packages aimed at older children include *Stickybear Math, Stickybear Math II, Stickybear Spellgrabber, Stickybear Typing,* and *Stickybear Reading.* Like the Sesame Street software, Stickybear programs use colorful graphics and animation, and both series have a proven appeal as starter packages for children.

Polarware's Dinosaurs Are Forever *is a computerized coloring book that uses graphics to help preschoolers become more familiar with computers.*

Another series of preschool gems come from Polarware. The series is called Electronic Crayon, and, as its name suggests, it is basically a computerized coloring book. The series includes *ABC's, Dinosaurs Are Forever, Fun on the Farm,* and *Holidays and Seasons.* Again, the emphasis is on graphics and becoming comfortable with the computer.

All these companies—and many, many others—offer fine starter software for older children as well. Sunburst Communications, for example, markets *The Pond,* which teaches pattern recognition to students in grades 2–8; *The Right Turn,* which introduces rotation, transformation, and pattern manipulation to students in grades 4–10; and *Puzzle Tanks,* which emphasizes math and volume concepts for grades 3 and higher. Also available from Sunburst are *M–ss–ng L–nks: Young People's Literature,* in which children fill in missing letters, and *The Whatsit Corporation,* which teaches entrepreneurial skills for older children.

Learn to Fly

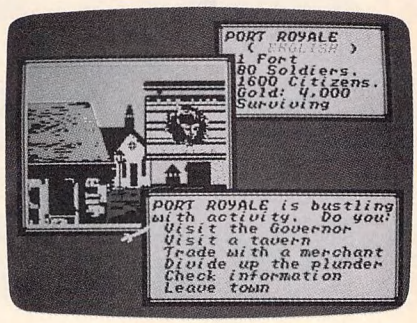
If you want your children to learn to ride a bicycle, you buy a bicycle and put them on it. If you want them to learn to swim, you take them to a swimming pool and help them. When they're older, and you want them to learn to drive, you put them behind the wheel with an experienced instructor beside them.

But if you want to teach them how to fly the latest jet fighter, to run a multimillion dollar business, to operate a modern nuclear submarine, or to control the U.S.A.'s missile defenses, it's much more difficult. And if you want them to know what it was like to command an ancient galley on the high seas, there's not a lot you can do.

Enter simulations. For many, this is the most exciting educational software—far better than curriculum-based educational software. Simulations offer experience-based learning rather than book-learning: You learn algebra from a book, but you learn to fly a plane by actually doing it. And a simulation can come very close to the real thing.

Live History

My interest in simulations as learning tools stems from personal experience. During high school, I had no interest in history, except to the extent that it was the only subject I ever failed. After high school, I started playing war games—the kind played on a paper map with cardboard counters. In two years, by combining playing these simulations with supplementary reading, I acquired a solid grounding in the history of World War II, eighteenth-century



In Pirates!, *you take command of a seventeenth-century sailing vessel and learn how to sail, fight, move into battle, and conduct trading expeditions.*

Europe, and the American Civil War. I was convinced.

Computer game designers have produced a host of simulations whose origin lies clearly with board war games. None of these is suitable as starter software, unless the computer novice already plays the board games. However good these products might be as teachers of history—and I refer here to the games produced primarily by SSI (California) and SSG (Australia)—they do not represent friendly, usable startup software.

Not all is lost, though, if your goal is to teach the novice history through simulation. Electronic Arts' *Seven Cities of Gold* and *Heart of Africa* force the player into the role of explorer. In *Seven Cities,* you must outfit an expedition to discover, explore, and acquire wealth in the New World, much as the earliest explorers did. *Heart of Africa* puts you in the Dark Continent at the time of Stanley and Livingstone, with tribal interaction a key feature.

A similar theme appears in MicroProse's *Pirates!.* Here you take command of a sailing vessel in the seventh-century Caribbean and look for ships and cities to plunder. To do so, you must learn how to sail, fight, move into battle, and conduct trading expeditions. Players can choose various difficulty levels, which means you can play the game with the novice as you teach. ▷

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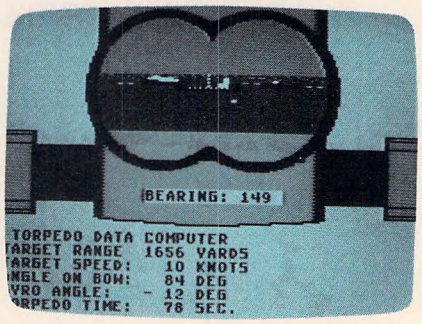
Military Mind

Many simulations place you inside a piece of military equipment. *Silent Service,* another MicroProse offering, lets you command a submarine in the Pacific theater in World War II. Six scenarios recreate different historical moments, in all of which you must allocate torpedoes and other weapons properly as you look through your periscope or search from atop the deck to find the ships you must sink.

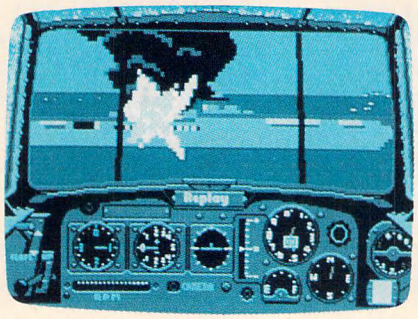


Silent Service *teaches you to command a World War II submarine and offers a taste of war in the Pacific theater by recreating events based on history.*

Somewhat easier to play is Epyx's *Sub Battle Simulator,* while on the other side of the difficulty scale is Spectrum Holobyte's *Gato.* Both games, like *Silent Service,* are based on World War II.

Games that allow you to pilot flying craft are numerous. Holobyte's *Orbiter* and *Lunar Explorer* are both highly educational. In the former, you pilot a space shuttle from its launch to its return, and you must rescue crew members, repair satellites, make repairs to the lab, and walk in space. *Lunar Explorer* complements this package by letting you pilot a lunar-landing vehicle.

One of the first highly popular simulations for the MS-DOS computers was Microsoft's *Flight Simulator.* It is hardly surprising, then, that the flight-simulator market has gone airborne, with a host of excellent packages now available. Microsoft itself keeps upgrading *Flight Simulator,* in which you pilot a Cessna 182 or a Gates Lear jet across a series of scenery disks released by SubLOGIC.



Battlehawks 1942*'s documentation offers a wealth of historical and military detail revolving around the Pacific sea and air battles of World War II.*

SubLOGIC itself has also released *JET,* a simulation of an F-16 Fighting Falcon or F-18 Hornet fighter. MicroProse has countered with *F-15 Strike Eagle,* which sets you in battle missions in Libya, Syria, and elsewhere, while Accolade offers *Ace of Aces,* in which you pilot an RAF Mosquito fighter-bomber. From Spectrum Holobyte comes the acclaimed *Falcon,* from Velocity the graphically superb *Jet-Fighter,* from Lucasfilm the historical *Battlehawks 1942,* and so on.

The point of listing all these is that all of them make excellent startup software for the older novice interested in just how realistic computers can be. Learn to land on an aircraft carrier in one of these games, and you have learned a great deal about what it's like to actually fly.

Don't Overlook Games

The most controversial type of startup software is games. For a host of reasons, we think of games as time-wasters, probably because they are considered to be something children do but adults don't.

I've never met a single child who would rather write a story with an excellent word processor than play an involving, challenging game on the computer. For this reason, a number of game designers have tried to make their games educationally valuable as well as engrossing.

One of the values of gaming is, simply, the player's interaction with the computer. Even a young child will quickly learn how to turn the computer on, insert the disk, and boot up the game, because interest is immediately high.

Loading a game like *Bubble Ghost* or *Test Drive* teaches a novice concepts such as *active disk drive, executable DOS files, graphics boards,* and *save disk.* Playing these games teaches them that the joystick or the keyboard is one way of telling the computer what to do.

Many of the games I list below are simulations. I separate them from the simulations above on the basis either of complexity or of real-world modeling. In other words, if it isn't complex, I call it a game rather than a simulation, and, even if it is complex, it's a game if it deals with situations, such as science-fiction settings, not found in real life.

Play Ball!

Sports games are numerous, and many act as superb startup software. If the novice knows how to play the game, the appeal lies in learning or practicing the strategy behind the play. If not, the appeal lies in learning a new game. As with simulations, there is a direct real-world correlation, to the extent that the novice can play a computer sports game at the same time as he or she is watching the real thing on television.

For baseball fans, there is *Earl Weaver Baseball, Pete Rose Pennant Fever,* and *Sporting News Baseball* (among others). *Earl Weaver* teaches the manager's options extremely well, while *Pete Rose* lets you guide a team from expansion to championship. ▷

Fast Features:

Learning Is FUN! Software

Title	Publisher	Price	Requirements	Graphics Appeal	Usability	Educational Value	Entertainment Value	Ages
Astro-Grover	Hi Tech Expressions	$9.95	256K; CGA	Very good	Very good	Excellent	Good	3–7
Award Maker Plus	Baudville	$49.95	256K	Good	Very good	Very good	Good	8 and up
AwardWare	Hi Tech Expressions	$14.95	256K; CGA	Good	Good	Very good	Very good	8 and up
Battlehawks 1942	Lucasfilm	$49.95	384K; CGA, EGA, MCGA, or VGA	Very good	Good	Excellent	Excellent	12 and up
Beyond Word Writer	Timeworks	$199.95	512K	Good	Good	Very good	N/A	15 and up
Big Bird's Special Delivery	Hi Tech Expressions	$9.95	256K; CGA	Good	Very good	Excellent	Good	3–7
California Games	Epyx	$39.95	256K; CGA	Good	Very good	Very good	Good	10 and up
Certificate Maker	Springboard	$39.95	256K; CGA	Good	Very good	Very good	Good	8 and up
Chessmaster 2100	Electronic Arts	$39.95	256K; CGA or EGA	Excellent	Very good	Good	Very good	12 and up
Create a Calendar	Epyx	$29.95	256K	Very good	Good	Excellent	Fair	10 and up
Defender of the Crown	Cinemaware	$49.95	256K (384K for Tandy); CGA or EGA	Excellent	Very good	Fair	Excellent	11 and up
Earl Weaver Baseball	Electronic Arts	$39.95	384K; CGA or EGA	Excellent	Very good	Excellent	Excellent	11 and up
Eight in One	Spinnaker	$59.95 (5¼-inch), $64.95 (3½-inch)	384K (5¼-inch), 512K (3½-inch)	Good	Very good	Very good	N/A	15 and up
Electronic Crayon—ABC's	Polarware	$9.95	256K; CGA	Very good	Very good	Good	Very good	2–7
Electronic Crayon—Dinosaurs Are Forever	Polarware	$29.95	256K; CGA	Very good	Good	Excellent	Very good	3–8
Electronic Crayon—Fun on the Farm	Polarware	$9.95	256K; CGA	Very good	Good	Excellent	Excellent	2–6
Electronic Crayon—Holidays and Seasons	Polarware	$29.95	256K; CGA	Good	Good	Very good	Good	4–11
Ernie's Big Splash	Hi Tech Expressions	$9.95	256K; CGA	Very good	Very good	Very good	Good	3–7
Ernie's Magic Shapes	Hi Tech Expressions	$9.95	256K; CGA	Good	Very good	Very good	Very good	3–8
Falcon	Spectrum Holobyte	$49.95	256K; CGA or EGA	Excellent	Fair	Excellent	Good	14 and up
F-15 Strike Eagle	MicroProse	$39.95	128K; CGA or EGA	Very good	Good	Very good	Very good	14 and up
Flight Simulator	Microsoft	$49.95	256K; CGA, EGA, or Hercules	Good	Fair	Excellent	Very good	14 and up
The Games—Summer Edition	Epyx	$39.95	256K; CGA	Good	Good	Excellent	Very good	9 and up
The Games—Winter Edition	Epyx	$39.95	265K; CGA	Good	Good	Excellent	Very good	9 and up

Title	Publisher	Price	Requirements	Graphics Appeal	Usability	Educational Value	Entertainment Value	Ages
Jack Nicklaus' Greatest 18 Holes of Championship Golf	Accolade	$49.95	384K; CGA	Very good	Excellent	Very good	Good	12 and up
JET	SubLOGIC	$49.95	256K; CGA	Very good	Fair	Excellent	Excellent	12 and up
Jetfighter: The Adventure	Velocity	$49.95	512K; EGA or VGA	Excellent+	Good	Very good	Very good	13 and up
Lunar Explorer	Spectrum Holobyte	$29.95	128K; CGA	Very good	Good	Very good	Very good	12 and up
Mean 18	Accolade	$44.95	256K; CGA or EGA	Fair	Very good	Very good	Excellent	12 and up
Microsoft Works	Microsoft	$149.00	384K; CGA optional	Good	Good	Very good	N/A	12 and up
M-ss-ng L-nks: Young People's Literature	Sunburst Communications	$65.00	128K (256K for Tandy); CGA	Good	Good	Excellent	Good	3–9
The Newsroom	Springboard	$19.95	256K; CGA	Good	Very good	Excellent	Very good	10 and up
Orbiter	Spectrum Holobyte	$49.95	256K; CGA	Very good	Good	Very good	Very good	12 and up
Pete Rose Pennant Fever	Gamestar	$44.95	512K; CGA or EGA	Very good	Good	Very good	Excellent	12 and up
Pirates!	MicroProse	$44.95	128K; CGA or EGA	Very good	Good	Excellent	Excellent	12 and up
The Pond	Sunburst Communications	$65.00	128K (256K for PS/2 Model 25 or Tandy); CGA	Fair	Good	Excellent	Good	6–13
The Print Shop	Brøderbund	$59.95	128K; CGA	Fair	Excellent	Very good	Very good	8 and up
Puzzle Tanks	Sunburst Communications	$65.00	128K (256K for Tandy); CGA	Very good	Good	Excellent	Fair	7–15
Reach for the Stars, 3rd edition	Electronic Arts	$44.95	256K	Fair	Very good	Very good	Excellent	18 and up
The Right Turn	Sunburst Communications	$65.00	128K (256K for Tandy); CGA	Good	Good	Excellent	Good	7–15
Sargon III	Spinnaker	$19.95	128K; CGA	Very good	Good	Good	Very good	12 and up
Seven Cities of Gold	Electronic Arts	$14.95	128K; CGA	Very good	Excellent	Very good	Excellent	12 and up
Silent Service	MicroProse	$39.95	128K; CGA or EGA	Excellent	Good	Excellent	Very good	14 and up
Sporting News Baseball	Epyx	$39.95	512K; CGA, EGA, or Hercules	Very good	Excellent	Very good	Very good	11 and up
Starflight	Electronic Arts	$49.95	256K; CGA or EGA	Very good	Good	Very good	Excellent	15 and up
Stickybear Math	Weekly Reader Family Software	$39.95	256K; CGA	Very good	Good	Excellent	Good	3–10
Stickybear Math II	Weekly Reader Family Software	$39.95	256K; CGA	Very good	Very good	Excellent	Good	5–12
Stickybear Numbers	Weekly Reader Family Software	$39.95	256K; EGA	Very good	Good	Excellent	Very good	3–7
Stickybear Reading	Weekly Reader Family Software	$39.95	256K; CGA	Very good	Fair	Excellent	Good	5–11
Stickybear Spellgrabber	Weekly Reader Family Software	$49.95	256K; CGA	Very good	Good	Very good	Good	4–9
Stickybear Typing	Weekly Reader Family Software	$49.95	256K; CGA	Very good	Very good	Very good	Good	4–10
Treasure Island	Spinnaker	$14.95	128K; CGA	Very good	Good	Very good	Excellent	8–15
The Whatsit Corporation	Sunburst Communications	$65.00	128K (256K for Tandy); CGA	Good	Very good	Very good	Fair	8–13
Where in Europe Is Carmen Sandiego?	Brøderbund	$44.95	256K; CGA	Very good	Very good	Excellent	Excellent	10 and up
Where in the U.S.A. Is Carmen Sandiego?	Brøderbund	$44.95	128K; CGA	Very good	Very good	Excellent	Excellent	9 and up
Where in the World Is Carmen Sandiego?	Brøderbund	$39.95	128K; CGA	Very good	Very good	Excellent	Excellent	9 and up
Wizard of Oz	Spinnaker	$14.95	128K; CGA	Very good	Very good	Very good	Very good	8–15
World Class Leader Board	Access	$44.95	256K; CGA	Very good	Excellent	Good	Very good	11 and up
World Games	Epyx	$39.95	256K; CGA	Good	Good	Excellent	Good	10 and up

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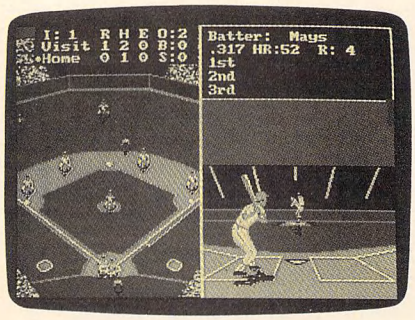


■ Earl Weaver Baseball *gives you the chance to act as manager, where you plan a successful season strategy by learning to get the most from your players.*

Sporting News combines management, play, and the fantasy of adding baseball greats to the lineup. All are excellent startup packages.

Golf fans can tee up to their heart's content. *Mean 18,* with its supplementary course disks, offers a wealth of play choices across a broad range of simulated courses. *World Class Leader Board* is graphically superior and somewhat simpler to play, but it lacks a few of *Mean 18*'s options. A recent release is *Jack Nicklaus' Greatest 18 Holes of Major Championship Golf,* which received design assistance from the master himself.

New Sports

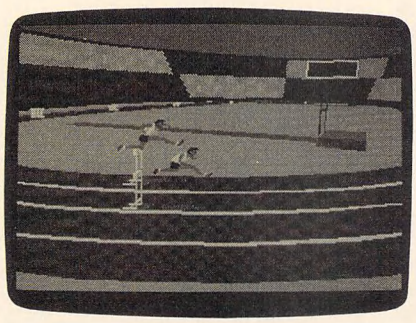
Away from baseball and golf, Epyx offers a series of packages that let the novice learn new sports. *The Games: Winter Edition* and *The Games: Summer Edition* go far toward helping the player understand Olympic events (does anyone really know the rules to the luge?).

World Games introduces such exotica as sumo wrestling, bull riding, barrel jumping, the giant slalom, the caber toss, and diving. Equally exotic is *California Games,* with surfing, BMX bicycle racing, skateboarding, and roller-skating. In all cases, the excitement lies in learning a new sport.

Chessmaster 2100, from the Software Toolworks, uses an extremely attractive 3-D display to lock the player into chess games of the desired difficulty. Hayden Software's *Sargon III,* meanwhile, uses an opening library of almost 70,000 moves and features a series of chess problems to solve.

Faraway Places

Mystery lovers can have a field day at the computer terminal. For novices, there is the excellent Carmen Sandiego series from Brøderbund. In these three games—*Where in the World Is Carmen Sandiego?, Where in Europe Is Carmen Sandiego?,* and *Where in the U.S.A. Is Carmen Sandiego?*—the player solves a mystery while learning a great deal about geography.



■ Summer Games *gives players a new perspective on Olympic events such as cycling, hurdling, pole vaulting, hammer throwing, diving, and more.*

The *Europe* game includes *Rand McNally's Concise Atlas of Europe,* while the *U.S.A.* version comes with *Fodor's U.S.A.* These three games will enthrall and educate any player above the age of 10.

Serious science-fiction buffs will want to examine Electronic Arts' *Starflight* and SSG's *Reach for the Stars,* the first of which teaches interaction with other life forms and the second which emphasizes monetary planning and the laws of supply and demand.

In the fantasy vein, Telarium's *Wizard of Oz* and *Treasure Island* introduce the 10- to 15-year-old crowd both to classic literature and to interactive fiction, while Cinemaware's *Defender of the Crown* incorporates medieval English history with elements of fantasy and diplomacy.

Power Packages

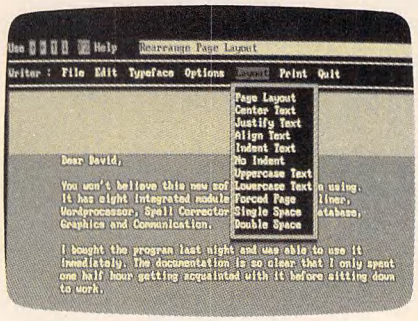
Let me say it straight out: Do not—I repeat, *do not*—start a novice with a complex relational database package, a full-featured spreadsheet program with five types of calculators, a CAD package that requires coordinates with three decimal places, or a desktop publishing package that opens with a request for PostScript specifications. Packages like this are superb in their place, but their beauty is not in the eyes of the novice.

Even so, there are an increasing number of applications software packages entirely suited for the beginner. Word processors, simplified desktop publishing packages, usable integrated software, even some programming languages can be learned and used by the novice.

The guideline here is to make sure the package is useful and that it contains enough features to let the novice progress to another level. You should make sure, too, that it includes a manual that doesn't require a degree in mechanical engineering to understand.

One for All

If you want your novice to start with productivity software, the best place to look is to the integrated packages. Spinnaker's *Eight in One* offers a word processor, a database program, a spreadsheet, a telecommunications program, a chart maker, desk accessories, and other applications, all for an extremely low price. The package will serve most students all the way through high school, after which it is time to look at Timeworks' *Quintet* and, at a more expensive level, *Microsoft Works.*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You won't believe this new sof
It has eight integrated module
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Graphics and Communication.
I bought the program last night and was able to use it
immediately. The documentation is so clear that I only spent
one half hour getting acquainted with it before sitting down
to work.

BetterWorking Eight in One *combines a word processor, spreadsheet, database, communications, and graphing into one easy-to-use, integrated package.*

Best Word

The PC world offers a wealth of excellent word processors, database managers, and spreadsheets. Few, however, offer good startup possibilities. In the word processor field, Ann Arbor Software's *Textra,* an inexpensive yet multifeatured package, offers an excellent online writing guide appropriate to high school and early college-age students.

Timeworks' *Beyond Word Writer* has the convenience of pull-down menus and of converting documents from other word processors as well. There's no need, in other words, to begin with the monsters; *WordPerfect, WordStar,* and their ilk have no place in the beginner's home.

For desktop publishers, a similar embarrassment of riches abounds. Brøderbunds' *The Print Shop* makes it easy for novices of all ages to produce cards, banners, stationery, and signs. *Award Maker Plus* (from Baudville), *AwardWare* (from Hi Tech Expressions), and *Certificate Maker* (from Springboard) let the user create certificates, licenses, signs, and announcements.

With Epyx's *Create a Calendar,* you can produce custom calendars, while Springboard's *The Newsroom* uses over 500 pieces of clip art and five fonts to let you put together newsletters. ▷

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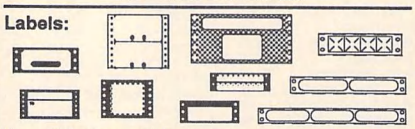

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Good Start

As with all these categories, this survey barely scratches the surface. All listed items, though, can serve as usable, attractive, even addictive startup software. The trick is to give novices something that will grab their attention and then hold it, and only the best-designed software can do this.

So which is best? It depends, 100 percent, on the novices themselves. If they love games, start them off with a game. If they like writing, drawing, or creating, try a desktop publishing package, a word processor, or a paint program. And so on. The only thing that matters is that the computer becomes an enjoyable, engaging tool—one that can teach the novice something new and in a way that will keep him or her returning to it. Once that process begins, instructing and delighting will start to happen automatically. **PC**

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Illustration by Scotty Billings

ONLINE POWER: HOW TO GET STARTED WITH TELE-COMMUNICATIONS

George Campbell

Computer enthusiasts all over the world are uniting in an information fest. They're sharing tips, software, mail, and much more with friends across the country and across the world. And you can join in without spending a fortune.

It's true that telecommunications used to be difficult and costly, but things have changed. Hardware prices have plummeted, and modern communications software is now so easy to use that you'll wonder why you didn't try it sooner.

This article will help you get online with information on hardware and software and a step-by-step guide to help you make your critical first connection. You'll also find timesaving tips and information about the best places to call.

Shopping Around

The first thing you need is a modem. Your PC lives in a binary world of bits and bytes. Normal telephone lines simply can't transmit these reliably.

Modem is short for *modulator/demodulator.* A modem converts binary data into signals that can be sent over voice telephone lines; then it converts them back at the receiving end. Advertisements for modems show a wide variety of prices and specifications. Choosing one for your own system is easier than you might think. Let's break it down.

Speed is the first option. A modem's speed, or *baud rate,* is measured by how fast it can send and receive single digital bits. You'll see figures ranging from 300 to 9600 baud. The fastest modems cost far too much for the average user, and 300-baud modems are obsolete.

For most users, the choice is between 1200- and 2400-baud modems. A 1200-baud modem transfers about 120 characters per second. A 2400-baud modem works twice as fast. Since the price difference between 1200- and 2400-baud modems is shrinking, if your budget can handle it, buy a 2400-baud modem. The extra speed will quickly pay for itself with savings on your telephone bill.

Pick Your Price

Prices range from under $50 for the least expensive 1200-baud internal modems to well over $600 for some name-brand 2400-baud external modems. If you buy from a reputable dealer or mail-order outlet, you shouldn't have any problems with a low-priced modem. I have two 2400-baud modems in my own system. One cost more than $400; the other cost less than $100. I can't tell the difference.

Be sure that any modem you buy is 100-percent Hayes-compatible. Hayes Microcomputer Products set the standards for modems years ago, and communications programs use that standard to communicate with modems.

Modems can be internal cards that plug into an expansion slot or external boxes that connect to your computer's serial port. External modems cost a bit more than internal modems and require a serial port. If there's an unused 9- or 25-pin connector on the back of your PC, you have a free serial port. You'll also need a serial modem cable, which adds to the cost. Internal modems are less expensive but require you to remove your PC's case for installation. They also require a free expansion slot in your PC.

Talk Is Cheap

To use your new modem, you need a communications program. Many modems come with free communications software. Some

TELE-COMMUNICATIONS

of these packages are excellent, while others are worthless. In any case, the solution is simple: Some of the best communications software is distributed as shareware, which means you can try out several programs before you buy one.

Three outstanding programs are *Qmodem SST,* version 4.0; *ProComm,* version 2.42; and *Boyan* 4.0. All are easy-to-use shareware programs available from user groups or mail-order shareware distributors. Get a copy of one of these programs at the same time you buy your modem.

Putting It Together

If you don't already have a modular telephone jack near your desk, you'll need to install one or have the telephone company or a private service install one for you.

If your modem is an internal card, you'll need to remove the cover from your PC. See your PC's manual for instructions. You also need to know which serial ports are already installed in your system. Serial ports are identified as COM1, COM2, and so on. On most systems, COM1 will already be installed.

Consult your modem's manual to find out how to set it for an empty serial port. This is controlled by a switch or a jumper on the modem card. Most internal modems come from the factory set for COM2, and that's the best choice. If your modem is set for COM1, change it to COM2.

Install the card in an empty slot in your PC. Remove the blank slot cover and then gently press the card into the slot, making sure it's fully seated. After you've replaced the computer's cover, connect the modem to the phone line. Most modems have two modular jacks. One connects to the wall jack, while the other is for your phone. If there are no markings, you can use either jack for either connection. You may need a telephone extension cord.

Modem-Speak—A Glossary

AT commands. Commands sent by your software to your modem (for example, ATDT *number* tells the modem to dial a number using touch-tone dialing signals). These commands were first developed by the makers of Hayes modems. All Hayes-compatible modems understand these commands.

Baud rate. The number of bits transmitted per second.

BBS. Bulletin Board System. This is a private computer system set up to answer modem calls. It usually has file-transfer and message facilities.

Communications parameters. A combination of Speed, Data Bits, Parity, and Stop Bits. Parameters are usually expressed like this: 1200,8,N,1. Both computers must use the same parameters.

COM1/COM2. The designation for the most common serial ports used on IBM-compatible computers.

Data bits. A number of bits sent as a single byte. BBSs usually send 8; commercial services send 7.

Duplex (or Echo). Some systems send the characters you type back to you; others don't. If you see two characters for every one you type, change to Full Duplex or turn Echo off, depending on your software. If you can't see what you're typing, switch to Half Duplex or turn Echo on. Full Duplex is the standard for most bulletin boards.

E-mail. Electronic mail. Private messages can be sent by modem through a BBS or commercial online system.

Line noise. Unwanted signals created by the telephone lines themselves.

Log off. To exit from a remote system. Use that system's command to log off properly.

Log on. To sign on to a BBS or another service. You'll usually need to supply a name and password.

Offline. Not connected to another computer by modem.

Online. Actively connected to another computer via your modem.

Parity. A single bit used for error checking. Most BBSs and commercial services set this bit to None, for *no parity checking.*

Protocol. A file-transfer system that corrects errors caused by line noise. XMODEM, YMODEM, and ZMODEM are examples.

Scripts. Special files that automate many communications functions. Available in most programs. See your manual.

Speed. The baud rate used for communications. Must match on both ends.

Stop bits. One or more bits sent by the modem to identify the end of a byte. Always 1 for PC communications.

If you've bought an external modem, locate the modem near your PC. Most external modems have a separate power transformer that plugs into a wall outlet. Plug that in; then connect the power cable to the modem. Connect one end of your modem's serial cable to the plug on the rear of the modem and the other end to the serial-port connector on your PC. It will only fit one way. Adapters are available if you have the wrong connector on your cable.

Plugging In

The shareware communications programs I recommended earlier come on two or more floppy disks. You will need to print the manual, which will be on one of the disks.

Use the DIR command to find a file that is a variation of the name README. If the extension of that file is COM, you can enter the name of the file as a DOS command to read the file. Otherwise, give the COPY README PRN command to print the file. You can substitute the actual name of the file. Follow the instructions in the README file to print a copy of the program's manual.

Read through the first part of the manual, which tells you how to install the program. You'll need to know which serial port your modem uses, the fastest baud rate for your modem, and whether you use touch-tone or pulse dialing. There are hundreds of options in communications programs, but those are the only ones you might have to change. You can explore the other options later.

Next read the sections of your software's manual that cover getting started and the program's basic commands. You can skip the detailed information at the back of the manual for now. The best way to learn to use your software is to use it during actual online sessions.

Your First Call

Finally, you're ready to use your new modem and software to make a call. If you have an external modem, turn its power on. Internal modems power up with your computer.

Start your communications program. You'll see an initial screen and then a blank screen with a status line on the bottom. This is the terminal mode, where you'll spend most of your time.

Type the capital letters *AT*. You may not see the letters on the screen as you type them. Once you press the Enter key, you should see the word *OK* on the monitor. If so, your modem and software are communicating properly. If not, you may have selected the wrong serial port. Review your manuals and change the settings.

Next, you need a telephone number to call. Start with a local bulletin board system. If you don't know a local BBS number, check with friends or local computer stores. If you're using one of the shareware programs recommended earlier, press Alt-D. The dialing-directory screen will pop up. For other programs, consult the manual for dialing-directory instructions. Follow your program's instructions to enter a new listing in the directory. Typically, you'll enter a name for the system and then its phone number.

There are several other options. To make sure your first connection is a success, set the speed to 1200 baud, the data bits to 8, the parity to N or None, and the stop bits to 1. The terminal type or emulation should be TTY, None, or ANSI. Finally, set Duplex to Full or Echo to Off. Leave any other spaces blank. For explanations of these terms, see the accompanying glossary.

Money-Saving Modem Tips

Online time costs money, especially if you're using commercial systems or making long-distance modem calls. Here are a few tips to help you cut your costs:

- Always use the highest baud rate that both systems can handle.
- Text often scrolls too fast for reading on your monitor. Use your program's file-capture command to save the text to a file. You can read it later, avoiding expensive online pauses.
- Learn the shortcuts for the systems you call. Commercial online systems often have fast, command-mode ways to save costly minutes. See the service's manual.
- Compose messages and E-mail before making a call. Save these as ASCII files and then use your software's ASCII upload commands to send them at full speed. Typing long messages online is expensive.
- Most communications programs let you automate logging on by using script files which automatically enter your name and password. Learn about these timesavers in your program's manual.
- All systems offer lists of the files available for downloading. If you download these lists, you can save valuable time by searching for the files you want while you're offline.

TELE-COMMUNICATIONS

To place the call, select the new number and then press Enter. You'll hear a dial tone, followed by dialing signals. If the line is busy, the software will keep dialing until it rings. Once the phone rings, you'll hear a series of tones, followed by silence. The dialing directory will disappear, and you'll be online.

Board Meeting

Next, you'll probably see text appear on your screen. If not, press Enter to alert the other computer. The text will identify the bulletin board. Then you'll see a prompt asking for your name. Some systems ask for separate first and last names. Just follow the prompts. You'll also be asked for other personal information. Then you'll be prompted to enter a password. Choose a password that's easy to remember, but something more complex than your first name.

If the BBS asks for screen size or other information, accept the default values by pressing Enter. If asked whether you want color graphics, answer by typing *NO* for the moment. After this, you'll see information about the BBS you've called. You can use your software's commands to send the information to your printer or to a file that you can read later.

Next, you'll see a menu of choices available on that bulletin board. You'll probably have limited options the first time you call. Make your menu choices by pressing the letter or number that identifies that choice. If nothing happens, press Enter. You can use Backspace to make corrections.

Every BBS has a menu entry for bulletins or announcements. That should be your first stop. You'll find information about using that BBS, along with a bulletin that lists other local BBSs. Use your software's commands to print or capture these bulletins. Once you've read the bulletins, go back to the system's main menu. Take your time and use any help options you see. Don't worry about doing something wrong. Bulletin boards are bulletproof.

When you've had enough for your first session, leave the bulletin board by using its good-bye or log-off command. It's considered impolite to just hang up.

You can also create new dialing-directory entries for other systems and give each of

Communications Troubleshooting

These tips, presented in the order in which you're most likely to encounter them, should help you solve the most common telecommunications problems.

The modem doesn't do anything. Are your software and modem set for the same COM port? Is that COM port used for some other device? Also, make sure that the power switch is on for external modems and that the correct cables are connected.

The communications software locks up. Some memory-resident programs are incompatible with communications software. Programs that display a clock on the screen are especially troublesome. Eliminate memory-resident programs one at a time to find the culprit.

A few odd characters appear. Probably line noise. Log off and try again.

Many odd characters appear. The Data Bits or Parity settings for the two systems don't match. Change the parameters and try again.

All characters are odd. Modem speeds for the computers don't match. Try the next lower speed.

The modem hangs up suddenly. Do you have call waiting service? If so, call your telephone company for information on turning it off while you're using your modem.

File transfers fail. Make sure both systems are using the same transfer protocol. For long-distance calls, try the XMODEM protocol. It's often more reliable.

The modem won't hang up. See your modem and software manuals for correct DIP-switch settings or modem commands. Look in the index for the terms *DTR* and *carrier detect*.

Your family complains. You're addicted to communications. Get a separate phone line for your modem. It's surprisingly affordable.

Sports and Music—Online

Welcome to the future. You may have heard that someday computers will link people from all over the world, not by geography, but by their common interests. But you don't have to wait. That kind of network is here, and two excellent examples are the USA Today Sports Center and PAN.

USA Today Sports Center

Now sports fans can get the latest scores and late-breaking news straight from the USA Today Sports Center's online service. Members can dial in to check on today's sports action, draft a fantasy football team, trade baseball cards, buy an official NFL jersey, chat with fellow sports fans, or play in a blackjack tournament.

Late-breaking sports news can be acquired several ways. If you purchase the communications and graphics software ($24.95 if purchased initially), a sports ticker can be activated that displays scores of games in progress across the bottom of your screen. Current scores can be found through the Sports Newsroom menu as well. If you wanted to find out how the New York Yankees fared in a game with the Minnesota Twins back in April, you could call up that score, too.

Statistics including league standings, box scores, and league and team leaders can be found in the Sports Center. Track your favorite team or your favorite player throughout the entire season. You can also call up complete team schedules and TV listings and find out the latest line on the big game.

The Sports Center also acts as your personal clipping service. Register a particular team from any sport and the Sports Center will save clippings on that team, keeping you up-to-date on team news including game capsules, injury reports, trades, hirings, and firings.

Most sports fans have always wanted to run their own team, draft their own players, make trades, set the starting lineup, and observe their progress during the season. The Sports Center's fantasy leagues make this possible for members. You can select teams and compete in fantasy football, basketball, hockey, and baseball. The baseball competition is based on the popular Rotisserie format that is sweeping the country. Whether your fantasy team wins or loses depends on your players' actual performances in real life.

Other features include electronic mail; classified advertising for buying, selling, or trading sports cards and memorabilia; and a sports store that sells authentic sports apparel.

If you're a sports fan and you thought you had everything, look again—you don't unless you subscribe to the Sports Center.

— Mickey McLean

PAN (Performing Artists Network)

Though many of its members are amateurs, PAN is designed for professional musicians. The network currently has over 2000 members, 192 phone lines, direct connections to Europe and Japan, and a database capacity of more than two gigabytes.

PAN has support hotlines for over 135 companies. These include electronic music companies such as Casio, Fairlight, Kawai, Oberheim, Opcode, and Roland, and industry magazines such as *Keyboard, Electronic Musician,* and *Music Technology.*

Here's a true story of how PAN's support hotlines have made a difference. Several weeks prior to the big industry show NAMM, Oberheim posted the specifications on PAN for its new DPX-1 sampling synthesizer. When the PAN members read that the device had only one audio output, they spent the next few days arguing with the Oberheim rep. At first he was defensive. But as he listened to their arguments, he finally began to agree and promised to talk to the company's technicians. Just days later, at the NAMM show, Oberheim announced it would ship its DPX-1 with multiple audio outputs.

PAN was also used in a unique trans-Pacific concert. In 1986, Claude Ciari performed simultaneously in Japan before a live audience and over Japanese TV. Ciari used PAN to send files to 20 synthesizers. His audience watched the process via a large-screen PAN display while Ciari and his colleagues performed. He also sent the same files back to the U.S. so that American PAN users could simultaneously download the files into their own synthesizers.

PAN also offers E-mail, travel and leisure services (for travel information and air, hotel, and limo reservations), classified ads (for equipment, jobs, and services), news-wire services, an electronic booking system, and downloadable databases (with hundreds of synthesizer, sampler, and sequencer files as well as many PC music programs and demo files).

It normally costs $150 to join PAN, but membership is available free with the purchase of many PC synthesizer programs. Connect charges are $0.20 a minute in the evenings and on weekends. There's no surcharge for 2400-baud service, and PAN credits you two minutes for each minute you spend uploading files.

If you're interested in music (especially if you're using computer-based synthesizers), check out PAN. You may find yourself part of a community that makes music all over the world.

— David English

TELE-COMMUNICATIONS

them a call. You may get telephone calls from the sysops *(system operators)* of the bulletin boards you call. They may want to confirm that you're not calling under an assumed name.

File Shuttle

Most bulletin boards maintain a large list of files that you can transfer to your computer. That process is called *downloading*. After you've called a local bulletin board, choose the menu entry for the file-transfer section. You'll see another menu with a command for listing available files.

Programs on bulletin board systems are usually stored as archived files, containing compressed versions of several files that comprise a program. On any BBS you call, the first file to download is the one used to expand archives. You can find out which one to use by reading the bulletins on that BBS.

To download a file, use the BBS's commands to find a file you want. Make a note of the filename; then tell the BBS that you want to download. That command is usually D. File transfers are made using error-correcting protocols. You'll be asked to choose one. For now, choose XMODEM. You can experiment with the others later. Then, when prompted, type in the filename you want.

Give your software's downloading command. The three programs mentioned earlier use the PgDn key. When asked, select XMODEM again and enter the filename. You'll see the progress of the transfer in a window.

Fast Features: Commercial Online Services

This chart lists some of the many commercial services along with some of the features they offer. These costs and services can change at any time. Look for special low-cost sign-up offers in magazine ads. Many modems come with free introductory memberships in one or more online services. (Letters in parentheses refer to footnotes.)

Service	Cost/Hour at 1200 Baud	Initial Fee	Files Available	Chat Services	News Services	Reference Services	Online Shopping	Travel Reservations	E-Mail Services	Special-Interest Forums	Local Access Numbers	Voice Information
Channel 1	None	$25.00 (j)	15,000+	Yes	No	No	Yes	No	Yes	Yes	Yes (e, h)	617-864-0741 (k)
CompuServe	$12.50 (b, l)	$39.95	10,000+	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	800-848-8199
Delphi	$7.20 (a)	$49.95	5,000+	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	800-544-4005
EXEC-PC	$5.00 (a, c, g)	None	50,000+	No	No	No	No	No	Yes	Yes	Yes (e, h)	414-963-2880
Galaxy	$3.50 (a, i)	$50.00	1,000+	Yes	Yes (e)	Yes (e)	No	Yes (e)	Yes	Yes	Yes	804-467-4887
GEnie	$6.00 (a)	$29.95	8,000+	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	800-638-9636
PAN	$12.00 (a, i)	$150.00	Over 2 gigabytes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	215-584-0300
PC-Link	$9.95 (a, c)	$29.95 (d)	1,000+ (e)	Yes (e)	Yes	Yes	Yes	Yes	Yes (e)	Yes	Yes	Radio Shack Stores
Prodigy	$9.95 (a, c)	$49.95 (d, f)	None	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	800-759-8000
The Source	$10.80 (a)	$33.45	5,000+	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	800-336-3366
USA Today Sports Center	$2.95–$17.95 (m)	$14.95	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	800-826-9688

(a) Evenings and weekends.
(b) 24 hours/day.
(c) Flat monthly fee.
(d) Includes necessary software.
(e) Additional charges apply.
(f) Includes three months' access.
(g) Allows 8-hours/week access.
(h) Through Galaxy/Starlink (see Galaxy entry).
(i) Plus $10 monthly flat fee.
(j) Introductory six-month membership; 30-minutes/day access.
(k) Call (617) 354-8873 by modem to try Channel-1 free.
(l) Plus $1.50 monthly surcharge.
(m) Depends on method of access.

Ignore any reported errors; the transfer protocol corrects them automatically. Sending a file to the BBS *(uploading)* is similar to downloading except that you use different commands. You can upload files or programs that you want to share with other users.

As you explore local BBSs, you'll discover many other options. You can exchange messages with other BBS users, ask questions about computing, or place ads for items that you are selling or want to buy.

Many systems offer online games and other activities. Some even have multiple phone lines, allowing you to chat with other users. In some cases, you'll be able to exchange messages with users in other cities. Every BBS is different, reflecting the interests of the sysop and its users. You'll soon discover which ones suit you best.

Going Big Time

Once you've gained experience with local bulletin boards, you may want to explore some of the commercial online services. Systems like GEnie and CompuServe are a bit like local BBSs, but they're expanded to include many more options. Using these services, you'll find all the options of a local BBS, plus access to encyclopedias and other information utilities. You can also shop, make travel reservations, buy or sell stocks, talk with other users in *chat* sessions, send electronic mail to other members, and talk directly to hardware and software vendors.

Commercial services are as easy to use as your local BBS, but there's a difference. These services aren't free. You pay for online time, usually with the fees charged to your credit card. The fees range from a flat fee of about $5.00 per month to $12.50 per hour and up. Your online expenses can add up fast.

For more information, see "Commercial Online Services," elsewhere in this article.

Number, Please

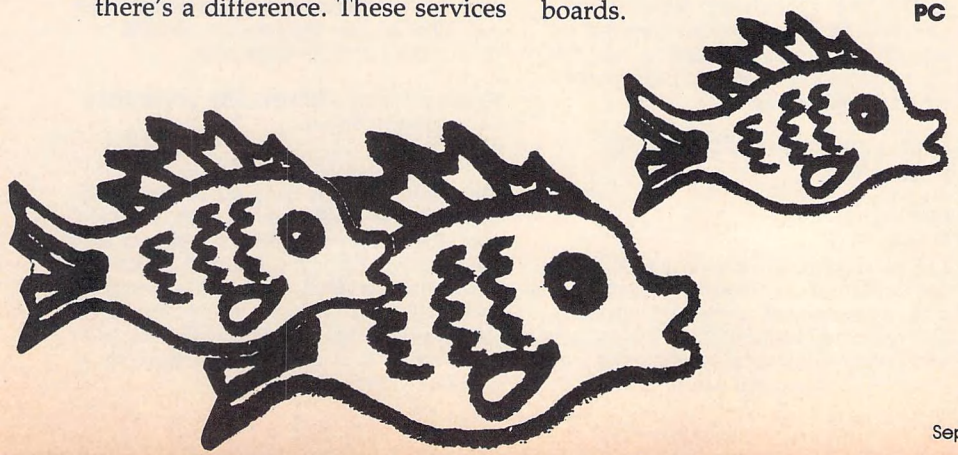
Once you have a modem, you can also communicate directly with other PCs over the phone lines to exchange files or just visit. The manual for your communications software explains how to do this.

Using any of the three programs mentioned earlier, you can even turn your PC into a mini BBS. Your computer can answer calls from other computers, allowing file transfers and message exchanges. It's as simple as giving a single command.

You can also call any BBS anywhere in the world. There are at least 10,000 BBSs in this country. Many of them are devoted to specialized topics. Local and national government agencies even set up systems full of free information. Naturally, you have to pay for the long-distance call.

Finally, many computer hardware and software companies maintain bulletin boards for customer support. It's often faster to call a support BBS with a question than it is to call a regular technical support number.

Now that you know the facts, you're ready to plug yourself in and tap into the power of telecommunications. See you on the boards. **PC**



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BUYER'S GUIDE

Self-Improvement Software

Discover a vast array of software that can help you get a better job, deal with stress, improve your memory, and much, much more.

CAROLINE HANLON

Psychological Assessment

Ever wonder what really makes you tick? These programs help identify personality traits in you and the people you know. Some of the programs are just for fun; others are designed to be beneficial and educational.

Eliza

Artificial Intelligence Research Group
256K required
$39.95

Eliza is a variation of the original program by Dr. Joseph Weizenbaum of M.I.T. You type in statements and the program responds with questions or comments, similar to the way a psychotherapist might respond to a patient.

Mind Prober

Human Edge Software
Distributed by Artificial Intelligence Research Group
256K required; printer optional
$39.95

Mind Prober can make psychological assessments of people according to information supplied by the user. The program presents a list of about 60 adjectives with which the user either agrees or disagrees. *Mind Prober* can then develop seven reports concerning the subject—introduction, relationships, attitudes toward work, coping with stress, personal interests, attitudes toward sex (or school, if the subject is under 18 years of age), and what makes the subject tick.

Mindviewer

Dexxa International
256K required
$49.95

If you've ever wondered what another person is really like, then this is the program to help you find out. You answer questions about another person's character traits such as achievement, ambition, and brilliance. The program then groups your answers into six categories of traits and creates a chart that can be printed. You can also print a report based on your answers.

Multidimensional Personality Evaluation

Psychological Psoftware
256K required
$100.00

Two hundred multiple-choice questions help you evaluate your personality in terms of passivity, assertiveness, aggression, manipulation, and other characteristics. The program generates an interpretative report and a chart of scores. The test takes about an hour.

Personality Profile 2

Psychological Psoftware
256K required
$49.50

Based on the principles of transactional analysis, this program helps give you insight into your personality dynamics. It also tries to explain anger, rescuing and helping, indulging and nurturing, and discounting and stroking.

Please Understand Me

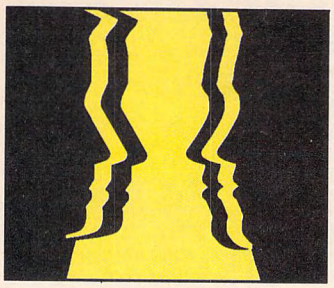
Career Development Software
256K required
$98.00

A personality self-assessment test, this program is based on David Keirsey's adaptation of C. G. Jung's theory of personality. Seventy questions help you determine your psychological type, temperament type, career interests, and information about your relationships with other people. The package contains three disks and a 209-page book.

Professional Personality Inventory

Psychological Psoftware
256K required
$200.00

This personality test measures 30 personality factors and evaluates normal adult personalities. The report provides an overview of the personality using both charts and text descriptions. The test can be used by psychologists, personnel managers, counselors, and school psychologists. *Professional Personality Inventory* is divided into three sections, each with 100 questions.



Social Interaction

Unless you live on a deserted island, you interact with other people every day. The software packages in this section help you deal with people—including your spouse and co-workers—and communicate more effectively.

Assertiveness Training
Psychological Psoftware
256K required
$49.50

Assertiveness Training teaches you how to be assertive and how to get your needs met. It also tests how assertive you are.

Heart-to-Heart, Version 2
InterActive Software
256K required; color graphics card and printer optional
$39.95

Heart-to-Heart provides a questionnaire and guided communication session to help couples determine the strengths and problem areas in their relationship. The questionnaire contains over 150 questions on 12 areas, such as leisure activities, finances, male and female roles, friends and family, sex and intimacy, and expectations. Each partner can take the questionnaire separately, and the answers and communication session can be displayed on color or monochrome screens or they can be printed. There are also over 100 daily quotations and communication exercises. Couples can choose one of five versions—married with children, married without children, unmarried, premarital, and unmarried with children. Version 2 displays the results of the questionnaire on the screen or prints them out by section. Results appear as a percentage of agreeing or disagreeing answers.

Intimacy, the Art of Communication
Psychological Psoftware
256K required
$49.50

This program helps you learn to communicate effectively with your mate. It explains the different levels of relationships and how to make those relationships work.

The Love Quest
Intracorp
256K required
$59.95

The Love Quest can be used to help you improve your relationships with the opposite sex. The program searches its database and advises you about the type of person you are most compatible with.

RSVP
Blue Lion Software
128K and color graphics card required
$39.95

A game and simulation help you test your knowledge of etiquette and learn how to handle situations at work and abroad. In the game, you choose a career and start out at the bottom of the career ladder. You can work your way up by learning the format for business letters, how to handle telephone calls, how to get along with co-workers, and how to participate in a formal dinner party. There are also quizzes on a variety of categories and countries to test your knowledge of international etiquette.

Working with a Boss
Career Development Software
256K required
$79.00

How do you react to authority? This program helps you assess your attitudes toward authority and learn how to deal with bosses in a constructive manner. You can determine your preferred boss style with the "Bossing Styles Inventory" and then store your own profile for later use. There's a quiz and a section that offers suggestions on following orders, listening, and getting ahead.

Working with Others
Career Development Software
256K required
$79.00

Working with Others is a guide to getting along with your co-workers. It helps you to identify work roles, such as the leader, producer, sounding board, or mentor, and gives you tips on avoiding problem workers such as the gossip, weeper, schemer, or victim. A simulation provides entertaining practice in identifying work roles.

Career Development and Job Searching

Looking for a new job or trying to get ahead in your present one? The following packages offer guidance on choosing a career, finding the job that you want, moving up the corporate ladder, and reaching your goals. You'll find information on everything from interview techniques and body language to surviving in a corporate environment.

Career Management Partner
Scientific Systems
Letter-quality printer required; modem optional
$89.00

Career Management Partner is a support package for job seekers. It contains the *Career Management Partner* software program, a booklet on techniques, a file disk with over 100 names and addresses of executive recruiters, a booklet for online prospecting, an introductory Dow Jones News/Retrieval packet, order forms for continuous personalized stationery, and a videotape. The software combines a word processor, name-and-address database, merge features, telephone dialing, and telecommunications so that the user can write letters and resumés and send them through the mail or online services.

Career Navigator
Drake Beam Morin
256K required
$129.00

Designed to help you in interviews and on the job, this package contains a handbook and software. The handbook explains how to write letters, select types of jobs, research organizations, and write résumés. The program includes a word processor for letters and résumés; a template for mailing résumés, applications, and letters; and a database for storing your personal profile.

The Corporation Job Game
Career Development Software
256K required
$99.00

In this game, you help three characters in realistic job scenarios as they attempt to climb the career ladder and succeed in a corporation. The program tries to show the political realities of the workplace and how to resolve conflicts. A second section explores 13 departments found in most corporations and helps you determine which departments you are best suited for.

Job Search
MCE
256K required
$82.50

Job Search is designed for anyone searching for a job. It guides you through looking for a job, defining your own interests and skills, researching potential employers, writing résumés, interviewing, and writing cover letters and follow-up notes. A teacher's manual is included. Available on 5¼- and 3½-inch disks.

Jobs in Today's World
MCE
256K required
$79.95

Non–college-bound students can try to match their interests with the characteristics of nearly 100 jobs listed in this program. The program then suggests various suitable occupations for the student. A career guide listing information on each occupation is also included. Program reading level is grades 3–4. For grade 9 to adult. Available on 5¼- and 3½-inch disks.

Managing to the Top
Career Development Software
256K required
$79.00

This program discusses six skills you will need to make it to the top in management: supervising, organizing, deciding, communicating, delegating, and budgeting. It uses case studies and scenarios to offer guidelines and then tests your knowledge with tutorials and quizzes.

The Micro Art of Interviewing
Career Development Software
256K required
$79.00

Five programs help you learn how to survive a job interview. The Worst Interview in History shows you what can go wrong in an interview. The Four Stages of Interviewing gives you tips for a successful interview. A skill-identification drill helps you choose key words to use in the interview and on your résumé. One section explains what to do in uncomfortable situations or when asked illegal questions. There's also a program to help you create your résumé.

The Micro Guide to Careers Series
Career Development Software
256K required
$449.00

This series of eight disks provides information on eight careers. Each disk contains an inventory profile to compare your interests to those of workers in a particular career and a job bank with more than 75 job descriptions and requirements. Career disks are available for nursing, fashion careers, counseling and teaching careers, office occupations, self employment, high-tech careers, sales careers, and liberal arts careers. Each program is also available separately for $59.

The Occupational Outlook on Computer, 1989 Edition
Career Development Software
256K required
$89.95

The Occupational Outlook on Computer is a database of the important occupations listed in the book *Occupational Outlook Handbook*. It provides information on the nature of work, working conditions, training, job outlook, earnings, related occupations, and sources of additional information for all the jobs listed.

Peterson's Career Planning Service (CPS)
Peterson's
256K and two floppy drives or a floppy and a hard drive required
$245.00

You can find the careers and occupations that most closely match your personality traits with this program. *CPS* guides you step by step through assessing yourself and recognizing interests and abilities. The program then offers career suggestions along with job descriptions, related jobs, and training requirements for each career. You can also learn how to make career decisions and plans for achieving career goals.

Present Yourself for Success
MCE
256K required; printer optional
$82.50

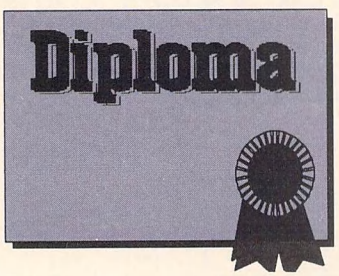
This program teaches you how to present a professional image through body language, attitude, speech, exercise, and dress. Graphics help demonstrate the lessons. A test and a personalized printout are available at the end of the program. Available on 5¼- and 3½-inch disks.

Setting Career Goals the Micro Way
Career Development Software
256K required
$79.00

This program helps you make career plans by defining and identifying goals, implementing goals, setting objectives, estimating costs in terms of time and money, and preparing to minimize risks. You can test yourself with situational analyses and multiple case studies. The program uses real-life examples and is completely menu-driven. The program is available on 3½-inch disks for an additional $5.

The Vocational Activities Inventory
Career Development Software
256K required
$79.00

You can identify your major vocational interest areas with this program. After answering 30 questions, the program scores you in six interest areas: doing, investigating, creating, helping, influencing, and organizing vocational careers. You are then given information on particular characteristics in each major interest area. Work sheets are included in the package.



Choosing a College

Sometimes the hardest decision on the road to self-improvement is choosing which path to take. If you're considering attending a college, university, or vocational school, but don't know which one, these programs can help you choose. They list a wide selection of two- and four-year schools as well as factors such as tuition costs, location, degrees awarded, and extracurricular activities.

College Directions
Career Development Software
256K required
$99.00

College Directions helps college-bound students decide which college to attend. Students list the factors most important to them in choosing a college, and based on those factors, the program lists suitable colleges. The college-planning section helps the student develop a plan for being accepted at the school. The four-year version contains information on all the accredited four-year colleges and universities in the U.S. The two-year version contains information on 1400 vocational, technical, and business schools, junior colleges, and two-year programs. The retail price of the two-year version is $97. *College Directions* is available on 3½-inch disks for an additional $5.

College Explorer
The College Board
256K and DOS 2.1 or higher required
$49.95

You can find the colleges that fit your needs with *College Explorer*. This database contains information on more than 2800 two- and four-year colleges that you can browse and sort according to your own criteria for choosing a school. You can then read the detailed descriptions on each college. School characteristics listed include degree level, majors, location, admissions rate, financial aid, freshman profiles, AP policies, enrollment size, on-campus housing, special programs and services, intercollegiate and intramural sports, student activities, tuition rates, and public, private, and religious affiliations. The program also explains why particular schools may not be on the list. Updates are available each year. Available in 5¼- or 3½-inch disks.

The Perfect College
Mindscape
$19.95

This database contains five main categories of information on more than 1600 four-year colleges and universities. The basics section lists information such as name, location, size, setting, climate, and cost. Competitiveness includes information on test scores, average GPA, and percentages. Academics, student life, and admissions provide additional information to help students choose which school to attend. Available on 5¼- and 3½-inch disks.

Peterson's College Selection Service 1989
Peterson's
256K required
$159.00

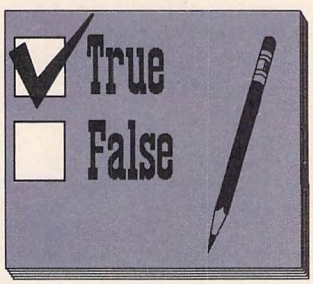
Revised annually, this program allows students to search for the colleges that have the characteristics they want. Snapshot descriptions of each college list factors such as total enrollment, entrance difficulty, tests required, costs, deadlines, and addresses. The program also helps students prioritize their criteria by showing them which school characteristics may be limiting their choices. It also shows why a particular school is not on the student's list. The four-year-college version contains information on over 1850 schools. A version for two-year colleges is available for $109.

Peterson's Financial Aid Service 1989 (FAS)
Peterson's
256K required
$195.00

A planning tool for families, *FAS* helps potential college attendees determine what their financial needs are, what their needs may be, where to look for financial aid, and how to calculate financial need. The program calculates costs based on the Congressional Methodology, compares costs at different types of colleges, estimates the family contribution, describes federal and state aid programs, and provides information on private sources of aid.

SAFIRE
Artificial Logic
256K and DOS 2.0 or higher required
$459.95

This program contains information on over 1000 scholarships, grants, contests, and allowances for vocational, community, two-year, four-year, master's, doctorate, and post-doctorate degrees. Each database record contains a description, address, phone number, type of award, deadlines, and dollar amount. The data is updated every year.



Test Preparation

Taking tests can be stressful. This is especially true when a high score can help you get into the school of your choice. The packages in this section help prepare you to take standardized, timed tests. They offer tips on test taking and point out areas where you may need extra practice.

Barron's Computer ACT
Career Development Software
256K required
$79.95

Hundreds of practice questions and drills help you prepare to take the American College Test. The package includes three double-sided disks and a manual. For grades 9–12.

Barron's Computer Study Program for the SAT
Career Development Software
256K required
$59.00

Six double-sided disks help students in junior and senior high school prepare to take the SAT. The program features a timed diagnostic mini-test and two timed SAT-like exams. There are also practice questions and drills. A score analysis helps identify strengths and weaknesses in more than 40 areas.

Computer Preparation for the ACT
Career Development Software
256K required
$59.00

Computer Preparation for the ACT simulates taking the American College Test. It creates individualized study plans and practice sessions using more than 970 drills. The package contains three double-sided disks, a 467-page textbook, and a 55-page user's manual. For junior and senior high school students.

Computer Preparation for the SAT
Career Development Software
256K required
$59.00

This preparation program for the SAT contains five practice tests that can be timed and scored, more than 540 drills, and 1000 vocabulary flash cards in 15 SAT study areas. The package includes a 430-page textbook and user's manual.

Computer Preparation for the SAT
Harcourt, Brace, Jovanovich
256K required
$39.95

Before you begin the SAT practice tests, a pretest helps you determine those areas on which you need to concentrate. The five practice tests are printed in the accompanying 430-page workbook, and you use the computer program to record your answers and time your tests. You can even take breaks during the test. The practice tests are divided into 15 categories similar to the actual SAT.

English Achievement Series
Mindscape
$159.95

For grade 10 through college, this series offers grammar practice for taking the College Entrance Examination Board's English Achievement Exam. After each set of 16 questions is finished, an approximate score is given, and an analysis determines where the errors are being made. In English Achievement I, students choose which highlighted word in a sentence is incorrect. Students decide which error in grammar, diction, wordiness, or mixed metaphor makes a sentence incorrect in English Achievement II. There are four rewrites of a sentence in English Achievement III and V, but only one is correct; the student must choose the correct sentence. Students have to find the punctuation, agreement, comparison, or parallelism error in the sentences in English Achievement IV. Each of the five titles is also available separately for $39.95.

French Achievement Series
Mindscape
$135.00

Three titles help students in grade 10 through college improve their French language skills and prepare for the College Entrance Examination Board's French Achievement Test. The programs include the full French character set and punctuation. French Achievement I: Vocabulary contains 150 problems and a dictionary of 600 French words. In French Achievement II: Grammar, students select the correct part of speech or idiomatic expression to complete one of 200 sentences. French Achievement III: Grammar contains 1800 problems arranged in 14 grammar categories to help drill students in French parts of speech and idiomatic expressions.

The GMAT Course
Comwell Systems
128K required
$59.95

The GMAT Course was designed with the assistance of M.B.A.s to help users prepare for the Graduate Management Admissions Test. This menu-driven program covers all the sections of the GMAT—problem solving, data sufficiency, analysis of situations, sentence correction, and reading comprehension. It includes timed tests, explanations and solutions of the problems, feedback on answers, automatic scoring, and score analysis. The quick-reference manual offers review sections, memorization tables, and glossaries.

Mastering the GMAT
Mindscape
256K and DOS 2.1 or higher required
$69.95

Mastering the GMAT is designed for students planning to take the Graduate Management Admissions Test. It explains how to take the test and answer the questions. Practice sessions help you identify your areas of weakness. The package includes workbooks and two practice examinations.

Mastering the GRE
Mindscape
256K and DOS 2.1 or higher required
$69.95

Post–high school students planning to take the Graduate Record Exam can use this program to practice taking the test and to assess their strengths and weaknesses. The program includes two complete exams and several exercises. The package contains four disks and a student workbook.

Mastering the LSAT
Mindscape
256K and DOS 2.1 or higher required
$79.95

Developed by lawyer and teacher Dr. Ted Silver, this test-preparation program is for anyone planning to take the Law School Admissions Test. Systematic strategies, practice sections, and practice examinations help you prepare for the test and concentrate on the areas where you may need extra preparation. A workbook is included for additional study.

The Perfect Score
Mindscape
$69.95

The Perfect Score helps students in grades 10–12 improve their skills for taking the SAT. The program contains six double-sided disks to test the six formats of the SAT. There are learning and testing modes and an onscreen clock to simulate a timed test. The test scores can be printed. *The Perfect College* is included in the package. Available on 5¼- and 3½-inch disks.

Peterson's SAT Success for Micros
Peterson's
256K and Hercules graphics card required
$49.95

This package for students preparing for the SAT includes the book *SAT Success* by Joan Carris for use as a workbook and study guide. The program helps students learn from their answers and pinpoints areas for further study. The program contains full-length practice tests in timed and tutorial modes and skill-building exercise in three levels of difficulty.

Score Improvement for the SAT
Spinnaker Software
256K required
$39.95

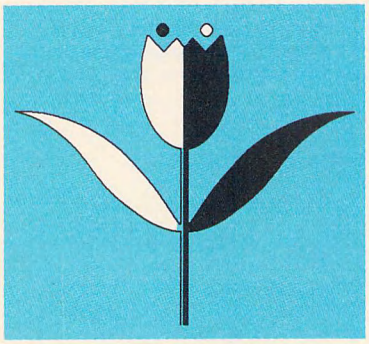
Score Improvement for the SAT is a comprehensive, computer-aided preparation package for students planning to take the SAT. It includes verbal, math, and practice exam modules. Teaching material is displayed on the screen, and a tutorial explains each answer as well as how to determine the answer.

Simon & Schuster's Computer Study Guide for the SAT
Simon & Schuster
256K and DOS 2.0 or higher required
$39.95

Simon & Schuster's Computer Study Guide for the SAT contains two verbal and math tests plus the Test of Standard Written English, 500 practice questions, a scratch pad, and a calculator. The automatic scoring system helps you identify your areas of strength and weakness while the bar graphs and projected SAT scores help you track your progress. All answers are explained, and help screens are available with a single keystroke. Available in 5¼- and 3½-inch disks.

Spanish Achievement Series
Mindscape
$135.00

Three titles help students in grade 10 through college improve their Spanish language skills and prepare for the College Entrance Examination Board's Spanish Achievement Test. The programs include an error analysis at the end of each test to point out areas where students are having trouble. Spanish Achievement I: Vocabulary contains 150 problems and a dictionary of 600 Spanish words. In Spanish Achievement II: Grammar, students select the correct part of speech to complete one of 200 sentences. Spanish Achievement III: Grammar contains 1600 problems arranged in 13 grammar categories to help drill students in Spanish parts of speech.



Lifestyle Decisions

One of the fastest-growing software areas deals with social issues such as stress overload, sex education, and drug abuse. The programs in this section are designed to give you nonjudgmental, fact-based information so you can make your own decisions.

AIDS: Acquired Immune Deficiency Syndrome
Substance Abuse Education Software
Color graphics adapter required
$49.95

Young adults can use this program to learn about Acquired Immune Deficiency Syndrome (AIDS). Topics include history, how AIDS affects the body, who gets AIDS, transmission, prevention, and treatment. The program content is based on recommendations by the Surgeon General. An interactive format, graphics, and a self-test are used to present the information.

The Baby Game
Substance Abuse Education Software
256K required; color graphics card optional
$49.95

This real-life simulation leads you through raising a baby, from delivery and paying the hospital bill to your child's 18th birthday. Aided by the animated, onscreen baby, you deal with everyday situations such as changing diapers or waking up in the middle of the night. The program is designed for a seventh-grade comprehension level.

Drinking and Not Drinking: The Choice Is Yours—Alcohol
Substance Abuse Education Software
Graphics adapter required
$39.95

In this alcohol education program, the students can type in their questions about drinking and other drugs, and the questions can be retrieved later by the teachers or parents. A tutorial helps explain the effects of alcohol, and a practice lesson provides terms and definitions related to alcohol. The program also contains a self-test for the students.

Introduction to Psychoactive Drugs
Substance Abuse Education Software
Graphics adapter card required
$39.95

In this program, graphics help show how psychoactive drugs affect the circulation and nervous systems. One section includes facts about the dangers, dependence, and psychological and physiological effects of drugs, and another section covers the legal aspects of drug possession. A self-test is included.

Keep off the Grass—Marijuana
Substance Abuse Education Software
Color graphics card required
$39.95

Graphics help explain the effects of marijuana, hashish, and hash oil, and a practice lesson contains terms and definitions related to marijuana use. One or two players can play a game of judgment, or players can take the self-test concerning marijuana and its effects.

Life Style Analyzer
Dynacomp
128K required; printer optional
$39.95

Life Style Analyzer helps you evaluate your health habits, activities, medical history, and family background to identify potential health problems. You can create what-if scenarios to see what effect changes in lifestyle might have on your overall health. The program provides personalized reports, graphs, and statistics on your relative risks. Risk factors are compared to those for other people in similar categories. *LSA* is based on data from The National Center for Health Statistics and The U.S. Public Health Service. For ages 8–74.

M.A.R.T.: A Guide for the Prevention of Leadership Stress
Career Development Software
256K required
$125.00

M.A.R.T. is a guide to preventing and handling stress overloads. It consists of four steps—management, awareness, reduction, and toleration. Each step is a separate program that helps you identify stress areas and learn how to deal with or change stressful situations.

Never Fat Again
Psychological Psoftware
256K required
$49.50

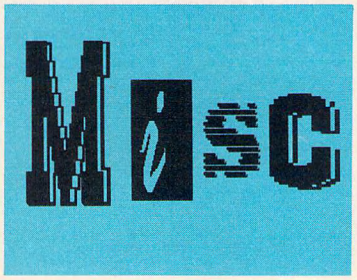
This weight-loss program is based on behavior modification instead of dieting. The program helps you evaluate and modify your eating habits to control how you eat, not what you eat.

Romance: Games of Choice About Sex
Substance Abuse Education Software
256K required; color graphics card optional
$49.95

Real-life situations and choices facing today's teenagers are addressed in this guide to sexual decision making. All the information is based on facts and deals with topics such as pregnancy, AIDS, and birth-control devices. The publisher warns that the program is very explicit and may be offensive to some users. The program is designed for a seventh-grade comprehension level.

Total Stress Management System
Psychological Psoftware
256K required
$100.00

TSMS helps you learn to deal with stress so your body is more relaxed and less susceptible to physical ailments. The first part of the system concentrates on stress in general. The second part deals with stress symptoms and remedies, such as relaxation, breathing, desensitization, exercise, meditation, time management, and behavior modification. It takes about 12 one-hour sessions to complete the whole program. The information can also be printed out. A clinical version is available for $200.



Miscellaneous

Here you'll find an assortment of programs for self-help, including speed-reading, managing your time more effectively, better driving, and improving your memory. Even if one of these packages isn't right for you, it may be just the thing for a family member or friend.

Evelyn Wood Dynamic Reader
Timeworks
$39.95

You can use this program to help increase your reading speed and comprehension. The package contains exercises and tools for learning to read faster, text for practice, and comprehension quizzes. Your progress can be recorded and displayed in color graphics on the screen. For age 14 through adult.

Homeworker
Davidson & Associates
256K and DOS 2.0 or higher required
$89.95

Homeworker is designed to help students in junior high through college become more productive. The program contains a word processor, an outliner to help plan projects, a flash-card maker, a calendar, a grade keeper that calculates grade-point average, and a calculator. The package includes a program disk, a manual, a notepad, divider tabs, and the book *How to Study for Success.* Available on 5¼- and 3½-inch disks.

Keys to Responsible Driving
Mindscape
Color monitor required
$89.95

Keys to Responsible Driving offers instruction in safe driving methods and techniques. Nine sections cover topics such as signs and regulations, city driving, driving under the influence, handling, and maneuvering. An included handbook, Guide to Safe Driving, provides information on driving laws, accidents, and driving terms. The package contains two disks with backups, a teacher's guide, and the handbook. You can purchase lab packs for $179.90. For grade 10 through adult.

Life Simulation 100
Thomas Life Systems
Microsoft BASIC required
$49.00

Life Simulation 100 is a what-if program to help you investigate the consequences of your decisions, such as graduating or dropping out of high school. It can be used as a guidance tool for schools, employers, counselors, and individuals in personal, family, career, and management counseling. The program uses the ripple theory in which the implications of a decision are seen throughout personal development. *LS100* is mathematically oriented and uses probabilities and actuary tables.

Lightning Learning
Artworx
256K required
$19.95

Lightning Learning is a guide to how memory works, what causes people to forget, and how to improve memory. Nine sections show the limits of memory and explain how people forget. The program then demonstrates memory techniques to help improve memory skills for all areas such as studying, foreign languages, social introductions, and card playing. Available on 5¼- and 3½-inch disks.

Mentor
Heuristic Research
256K, DOS 2.1, and color graphics card required
$49.95

Mentor was designed to help users improve their mental abilities—memory, reaction, coordination, perception, keenness, and awareness. It contains over 50 psychological tests and exercises and 25 I.Q. tests. There's also a built-in information module. The program has been tested on people ages 6–60.

Pacesetter
Mindplay
Color graphics card required
$69.99

Students in grades 3–12 can learn to schedule their time and track their progress with this program. It includes 13 templates to track homework and reports and ten types of progress reports. You can print a certificate of completion as well as monthly and yearly calendars. Teachers can use the challenge upgrade to create templates for teachers and parents. A lab pack is available for $190. Available on 5¼- and 3½-inch disks.

For more information about the products discussed in this buyer's guide, contact the publishers at the addresses listed below:

Artificial Intelligence Research Group
921 N. LaJolla Ave.
Los Angeles, CA 90046

Artificial Logic
P.O. Box 3995
Champaign, IL 61821-0995

Artworx
1844 Penfield Rd.
Penfield, NY 14526

Blue Lion Software
P.O. Box 650
Belmont, MA 02178

Britannica Software
185 Berry St.
San Francisco, CA 94107

Career Development Software
207 Evergreen Dr.
Vancouver, WA 98661

The College Board
45 Columbus Ave.
New York, NY 10023-6992

Comwell Systems
2100 S. Rural Rd.
Suite #2
Tempe, AZ 85282

Davidson & Associates
3135 Kashiwa St.
Torrance, CA 90505

Dexxa International
189 Airport Blvd.
Burlingame, CA 94010

Drake Beam Morin
100 Park Ave.
4th Floor
New York, NY 10017

Dynacomp
Dynacomp Office Bldg.
178 Phillips Rd.
Webster, NY 14580

Harcourt, Brace, Jovanovich
465 S. Lincoln Dr.
Troy, MO 63379

Heuristic Research
3112-A W. Cuthbert Ave.
Midland, TX 79701

InterActive Software
496 La Guardia Pl.
Suite 215
New York, NY 10012

Intracorp
14160 SW 139th Ct.
Miami, FL 33186

MCE (Microcomputer Education)
157 S. Kalamazoo Mall
Suite 250
Kalamazoo, MI 49007

Mindplay
Methods and Solutions
3130 N. Dodge
Tuscon, AZ 85716

Mindscape
3444 Dundee Rd.
Northbrook, IL 60062

Peterson's
Dept. 9303
P.O. Box 2123
Princeton, NJ 08543-2123

Psychological Psoftware
312 Los Altos Dr.
Aptos, CA 95003

Scientific Systems
5 Science Park
New Haven, CT 06511

Simon & Schuster
A Gulf + Western Company
One Gulf + Western Plaza
New York, NY 10023

Spinnaker Software
One Kendall Sq.
Cambridge, MA 02139

Substance Abuse Education Software
670 S. 4th St.
Edwardsville, KS 66113

Thomas Life Systems
17408 NE 19th
Bellevue, WA 98008

Timeworks
444 Lake Cook Rd.
Deerfield, IL 60015

Pacesetter Projects 1

Mindplay
Pacesetter required
$24.99

The *Pacesetter Projects 1* disk contains activities to use with *Pacesetter* to help students who need extra motivation and reinforcement. It offers projects that require simple experiments and research, such as science and social studies projects and planning a Thanksgiving dinner.

Remember!

Britannica Software
128K and color graphics adapter required; printer recommended
$49.95

Remember! is designed to help anyone age 12 and older organize and recall material. It can be used to organize words, definitions, explanations, and lists. The program provides written, pictorial, and musical hints to help you recall the information. You can also test your memory. The manual includes information on human memory and learning techniques. French and Spanish vocabulary disks are available for language students, and high school students can practice for the SAT with additional vocabulary and math skills disks. Available on 5¼- and 3½-inch disks.

Speed Reading Tutor IV

Simon & Schuster
128K, DOS 1.1 or higher, and two disk drives required
$39.95

Speed Reading Tutor IV includes practice readings by contemporary authors, eye exercises, quizzes, and a review feature to brush up on techniques once the program has been completed. *Tutor* begins by determining your level of proficiency and customizing lessons to your abilities. The lessons contain a practice reading, a reading timer, and a page pacer. The reading timer judges how fast you're reading, and the page pacer beeps when it's time to turn the page. At the end of the lesson, you can take a comprehension quiz. A graph shows your speed and comprehension scores. Each lesson lasts about an hour, and the lessons are designed to be taken two or three days apart. The object of the lessons is to increase reading speed to two or three times the initial rate without losing comprehension of the material.

The Thinking Machine

Psychological Psoftware
256K required
$89.50

The Thinking Machine is designed to help you learn to use both sides of your brain. It uses 40 questions to determine if you are right- or left-brain dominant and then tests to see if you know how to think. Exercises help you to overcome negative thinking and learning habits, in addition to developing new ways of thinking. The program emphasizes right-brain thinking. **PC**

Calling All Shareware Authors!

George Campbell

"The Best of the Boards" is looking for exciting new public domain and shareware programs. We're interested in games (MDA or CGA), utilities, productivity software, home-oriented software, applications, small communications programs, entertainment-oriented software, and educational software (K–12). If you have written a program and are interested in having us consider it for publication, here's what *COMPUTE!'s PC Magazine* offers shareware authors:

- Inclusion of the entire program, including requests for registration fees.
- Distribution to well over 80,000 users—a number that's growing with each issue.
- A fee for one-time publication rights.
- Readers who are willing to *register.* (Registrations typically run to several hundred per program.)

Programs submitted for use on the *COMPUTE!'s PC Magazine* disk should

- Appeal to a wide range of users.
- Be easy to use. For anything other than simple utilities, that means offering menus and online help.
- Be reasonable in length. We use as many as five or more shareware programs per issue, and they all have to fit on a 360K disk.
- Be usable on a wide range of IBM-compatible equipment. That means that MDA compatibility is important, unless graphics are at the core of your program. Graphics programs and games should be CGA-compatible or have a CGA option. Also, many of our readers use Tandy equipment. If possible, test your program on a Tandy.
- Have complete documentation.
- Have all features available in the shareware version. No crippled programs are accepted.
- Be the latest version of the program.

There are some things we definitely *don't want,* too:

- Programs aimed at a small, specialized group of users.
- Viruses or other dangerous programs.
- Buggy programs. (They have to *work!*)
- Programs with impolite exits to DOS. (Give users a chance to abort.)
- Programs that require rebooting to exit. (There's no excuse for this.)
- Pirated software.
- Software using a trademark or copyrighted name or interface. (No Monopoly- or *Pac-Man*–type games, for example.)
- Uncompiled BASIC programs.
- Programs with many misspellings in the executable file.

If you want to submit your program for consideration, follow these guidelines:

- Submit your program with all the necessary files.
- Be sure documentation files are pure ASCII. No printer-specific documentation is accepted.
- Submit programs as ARC or ZIP files, using your favorite file-compression program.
- Include a short ASCII file with your name, address, and *telephone number* so that you can be contacted easily. Add the hours you can be reached at that phone number.

You can submit your program in either of two ways. You can mail your program, sending two duplicate disks (360K or 720K) in a protective mailer to

George Campbell
1472 Sixth St.
Los Osos, CA 93402

Be sure to provide the information necessary to contact you.

You can also submit your program by modem via the SLO BYTES BBS:

- Set your communication parameters to 2400/1200/300 8/N/1.
- Call SLO BYTES BBS at (805) 528-3753.
- Enter SHAREWARE AUTHOR at the first-name prompt.
- Enter PROGRAM at the password prompt.
- Select the [F]iles command at the main menu.
- Select [U]pload a file from the Files menu.
- Upload your ARC or ZIP file, using XMODEM for safety.
- Describe the file in the two-line description.
- Select [Q]uit to Main Menu after you've uploaded.
- Select [C]omments to the Sysop at the main menu.
- Leave a short private message describing your program and telling how you may be reached.
- Log off.

Please note that this is a user group's BBS and that you will have access to only one file area and one message area. If you want further access to the BBS, log on again with your real name.

After you've uploaded your program, please be patient. I'll get in touch with you one way or another. If we can use your program, I'll call you at your voice number and discuss it with you. If not, I'll drop you a postcard. In either case, it may take a little time for me to respond. **PC**

CD-ROM
Ready to Blast Off

Clifton Karnes

CD-ROM is more than just encyclopedias on a disc. It's dazzling graphics, stunning sound, and TV-quality video.

No technology has the potential to change the way we use computers more than CD-ROM. With each optical disc holding *hundreds* of megabytes, new systems of storing and retrieving CD data can incorporate graphics, sound, and even video into one powerful, interactive CD-ROM–driven environment.

In a few years we'll see stunning CD-ROM applications, and CD devices may be as common as floppy disk drives are today. You don't have to wait to take advantage of CD technology, however. CD-ROM is here now with exciting, innovative products.

But CD-ROM raises more questions for potential buyers than any other technology. What equipment do I need for CD-ROM? If I buy a CD-ROM system now, will my investment be compatible with future CD-ROM products? What are the new horizons in CD-ROM? Will CD-ROM make hard drives obsolete?

To answer these questions, it's necessary to realize that CD-ROM is really a cluster of different optical devices and formats. Until the Fourth Annual CD-ROM Conference, held this past March in Anaheim, California, it wasn't clear where CD-ROM was going or which of the competing technologies would become standards.

The conference (which is sponsored each year by Microsoft and was held, appropriately, just two blocks from Disneyland) took a hard look at CD-ROM's present situation and gave a clear vision of CD-ROM's future—a future focused on three related platforms: standard CD-ROM, CD-ROM XA, and DVI.

What You'll Need

Standard CD-ROM

Computer:	PC, XT, or AT
Video System:	Monochrome, Hercules, CGA, EGA, or VGA
Memory:	640K
Operating System:	DOS

■ Standard CD-ROM requires a PC, XT, or AT with any video display system and a CD-ROM drive that supports standard Microsoft formats. This CD technology is here today with approximately 500 software titles available. If you buy standard CD-ROM now, however, your system may not be compatible with CD-ROM XA.

Ton of Text—Standard CD-ROM

When you think of CDs—compact discs—you probably think of audiodiscs first. Because of their noise-free reproduction, these shiny platters have all but replaced vinyl analog recordings as the medium of choice for serious audiophiles.

Computer CD-ROM discs are nearly identical to their audio counterparts, except that each disc's 600MB capacity is devoted to data—mostly text—rather than audio information. And, just like audio CDs, CD-ROM is a read-only medium: You can't record on an audio CD, and you can't write to a standard computer CD-ROM. Because they're read-only, CDs aren't an alternative to a hard disk, but their huge data reservoir can easily complement a hard disk's read/write storage.

With CD-ROM's storage capacity, packing tons of text on an optical disc for easy reference is a natural, and CD-ROM made its first big splash by housing the entire *Grolier*

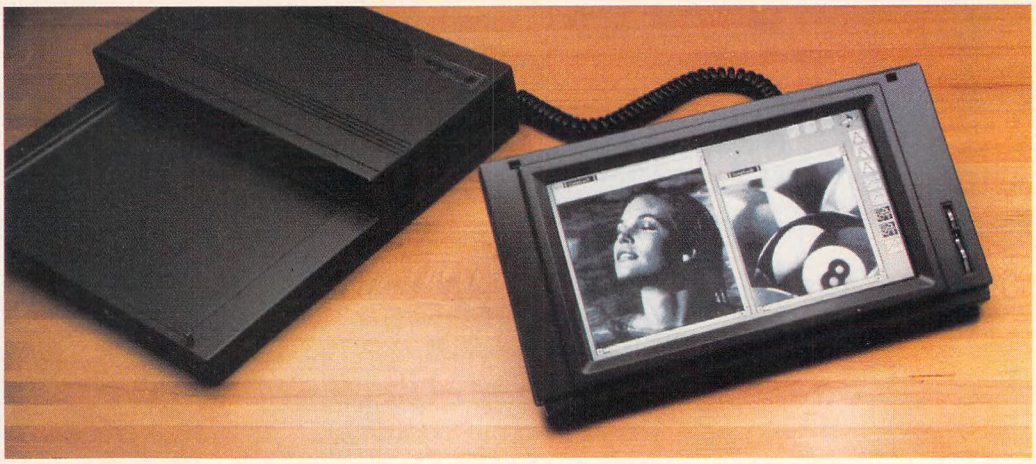
Encyclopedia on a single disc. As useful as an encyclopedia on disc may be, applications such as *Microsoft Bookshelf*, which jams several essential reference works onto one disc, are more exciting.

The latest example of this everything-you-always-wanted-to-know-about-a-subject approach was demonstrated at the conference with *The Bible Library*, a one-stop theological reference that squeezes 60 sources onto one compact disc.

The Bible Library includes nine Bibles (English and original Hebrew-Greek transliterations), five word studies, six dictionaries, two commentaries, one hymn source, and six sermon outlines.

With this one CD, you can research any Biblical topic and compare the original texts against the major translations; check the translations against Hebrew and Greek dictionaries; explore the major commentators' opinions on the subject; and finally, examine the way the topic has been treated in sermons.

At $1,390, *The Bible Library* is expensive, but for a school, library, church, or synagogue, it's affordable; and the price of this reference, and similar products, is bound to drop as CDs become more popular.



■ With DynaBook, you can read standard CD-ROM disks anywhere. And you have a full-fledged 80286 computer, to boot.

Read It with DynaBook

One problem with CD-ROM devices is that they're tied to a desktop computer. If you want to consult your CD-ROM references while you work in a library, while you're on a trip, or when you're anywhere else for that matter, you have a problem. At least you've had a problem until recently.

Scenario demonstrated its solution at the conference: the portable DynaBook CD-ROM reader. With its beautiful gray-scale VGA resolution, this high-tech CD-ROM reader is a real 80286 MS-DOS computer inside. Although DynaBook doesn't come with a keyboard (its main strength is that you don't need one to operate it), you can buy an add-on keyboard and use this machine for any PC application.

When you pop open DynaBook's hood, you find a 10-MHz 80286-based AT with 640K that runs all standard MS-DOS applications. Included with the system are an integrated CD-ROM drive; a touch-screen display; CGA, Hercules, and pseudo-VGA (using gray scale to approximate color) video; serial and parallel ports; and a keyboard port for the optional keyboard.

The price for this beauty? A cool $4,995. But as with most products in this area, prices should drop as demand increases.

Sound Storage: CD-ROM XA

Standard CD-ROM applications make access to massive amounts of data possible, but CD-ROM has the potential for more than just storing text. Engineers realized years ago that with its ability to house hundreds of megabytes of data, CD-ROM could be used as a medium for graphics, sound, and even music. That's where Microsoft's CD-ROM XA comes into play. Although the technology was announced a year ago, it wasn't until this year's CD-ROM Conference that XA's potential was clear.

The big news with CD-ROM XA is that it mixes audio with video and synchronizes the two. The means of encoding and decoding audio and video information is so sophisticated that nearly full-motion animation (not video) is possible. Planned applications include games, educational programs, and productivity products (imagine an encyclopedia/dictionary with pronunciation and video illustrations). ▷

What You'll Need

CD-ROM XA

Computer:	AT or 80386, with advanced audio system
Video System:	VGA or Super VGA
Memory:	640K–1MB
Operating System:	DOS or Windows

■ CD-ROM XA combines sound with text and synchronizes the two. It's not available yet, but drives should be on the market within a year. If you're buying a computer system that you want to use with XA, you would be wise to buy a machine with features at the upper limit of those mentioned above.

CD-ROM XA won't be available for a year or so, but in one of the most important announcements at the conference, Bill Gates, chairman of Microsoft, said that XA technology was so inexpensive that it would add virtually nothing to the cost of a standard CD player. And he said that it will be possible to upgrade many standard CD players now in use to XA technology simply by changing the drive's controller.

This means that you can buy a standard CD-ROM drive today and have a chance of being able to upgrade to XA later.

Pure Power—DVI

Perhaps the most exciting announcement at the CD-ROM Conference was that Intel and IBM have signed a joint development agreement for DVI—an amazing technology with an amazing past.

The idea behind DVI is to combine CD-ROM's huge storage capacity with superpowerful graphics-compression techniques. With massive compression and high-speed decompression, images can be played back at a rate that creates full-motion, TV-quality video.

Intel saw the potential for DVI about a year ago and bought not only the technology, but the whole DVI research team from GE's Sarnoff Labs. In the last year, Intel has been working with IBM, ironing out the details of this technology, which may someday be part of every PC and every PC operating system.

With Intel and IBM behind DVI, we can expect some spectacular progress in DVI development. And, although no one was making any promises, the giants hinted that custom DVI chip sets could be incorporated into the motherboard of PS/2s and that DVI software could be integrated into the operating system of OS/2 in the future. How far in the future? No one said for sure, but the date that kept popping up was 1992.

One of the most interesting aspects of DVI is that applications are available now. These applications are expensive and intend-

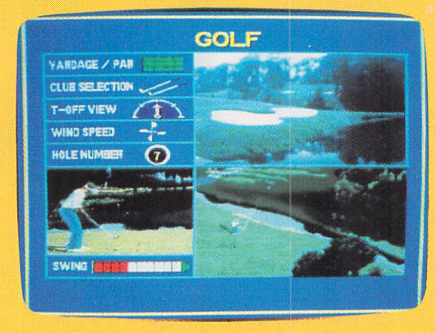
What You'll Need

DVI

Computer:	80386
Video System:	Super VGA
Memory:	4MB
Operating System:	OS/2 Presentation Manager

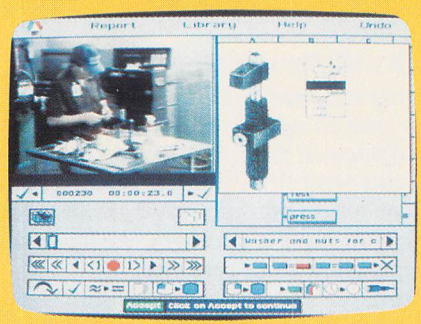
■ DVI is available now, but it's very expensive. If you're planning to add DVI to your system, you'll need a powerhouse computer to drive it. The four megabytes of RAM is just for starters; you may need more. And your 386 should run at 25 MHz or better.

DVI in Action



Full-motion golf.

Museum tours.



Motion analysis.

■ *DVI mixes reality, fantasy, and computer power in unprecedented ways. Here are just three examples of the potential of DVI. Imagine playing golf using a real video of famous golf courses, taking an interactive tour of a museum, or using Anderson Consulting's* Process Analysis Workbench *to make an interactive motion analysis.*

■ *Japan's hot-selling PC Engine, with its optional CD-ROM drive, should be available in the U.S. by the time you read this.*

■ *If you jotted down a wish list for a PC with an integrated CD-ROM drive, you'd probably come close to the FMTowns.*

ed primarily for business use, but home productivity and entertainment are on the DVI agenda. It's just a matter of time before DVI will be available to home users.

Perhaps the biggest surprise about DVI was the announcement that it will be downwardly compatible with CD-ROM XA. This means that you can, at least in theory, buy a standard CD-ROM drive tomorrow, upgrade it to CD-ROM XA in a year or two, and, when DVI is available, buy a DVI system and still be able to play all your standard CD-ROM and CD-ROM XA discs.

CD-ROM Japan

With the course of CD-ROM set in the U.S., it's interesting to take a quick look to the east to see what's happening on the Japanese front. If you could have fought your way through the crowds at the NEC and Fujitsu booths at the conference, you would have seen two of the hottest Japanese CD-ROM products: the PC Engine and the FMTowns.

The PC Engine is a games machine built to go head to head with the now-popular Nintendo systems. But the PC Engine has considerably more power than Nintendo. For one thing, it uses a high-powered, custom-built CPU, and for another, it's designed to work with an optional CD-ROM drive.

If you could have fought your way through the crowds at the NEC and Fujitsu booths, you would have seen two of the hottest Japanese CD-ROM products: the PC Engine and the FMTowns.

NEC realizes that the CD-ROM drive gives this machine an edge, not just for home entertainment, but for home education as well. And the PC Engine's CD-ROM drive has a big ace in the hole: It can be used as an audio CD player, too.

At the high end of the Japanese market's computer/CD-ROM union is the Fujitsu FMTowns. This machine is a full-throttle 80386 screamer with a built-in CD-ROM drive. The Towns runs a proprietary operating system, though it can run a non-PC-compatible version of MS-DOS, too.

The Towns' CD-ROM drive plus its 386 power make it a spectacular machine for games, music, paint, and video programs. Just take a look at some highlights from the Towns spec sheet (but make sure you're sitting down).

The machine features 1MB–2MB of memory standard, expandable to 6MB; a maximum video resolution of 640 × 480 with 256 simultaneous colors from a palette of 16,770,000; as many as 1024 sprites; stereo sound; one or two 1MB 3½-inch disk drives; three expansion slots; and, of course, the *coup de grâs:* a 540MB built-in CD-ROM drive.

As we were going to press, NEC announced that the PC Engine, previously

Acronym Alley

CD-I: Compact Disc–Interactive was developed in 1987 by Philips and Sony to provide a platform for interactive home entertainment. CD-I doesn't require a computer—it's completely self-contained.

CD-ROM: Compact Disc–Read Only Memory drives first appeared in 1985. Since then, the installed base of CD-ROM units has grown to more than 170,000 with more than 500 titles available.

CD-ROM XA: CD-ROM Extended Architecture was proposed a year ago by Philips, Sony, and Microsoft. This new standard synchronizes sound and graphics and is similar to CD-I, but unlike CD-I, XA requires a computer.

CD-V: Compact Disc–Video was developed by Philips and Sony for five-minute, noninteractive videos that play on CD LaserDisk systems connected to conventional televisions.

DVI: Digital Video Interactive was originally developed at GE's Sarnoff Labs and recently sold to Intel. It offers dazzling full-motion video and audio, as well as standard text and graphics.

available only in Japan, is being released in the U.S. market. (For more details on the PC Engine, watch "PC News & Notes" in future issues.) As of now, there are no plans to release the FMTowns in the U.S., but it may serve as the prototype for a Fujitsu-built machine for the U.S. market.

Visions

The future of standard CD-ROM, CD-ROM XA, and DVI looks sunny indeed, but there are two critical things that must happen before we begin to see large numbers of CD-ROM–family products for the home market.

First, the number of CD-ROM drives installed in the U.S. is going to have to grow from its present 170,000 to well over 1,000,000. That's the critical mass Microsoft chairman Bill Gates suggests is necessary to fuel the software market.

The second crucial element is the price of CD-ROM drives (both standard and XA). Experts suggest that prices for a CD-ROM drive and controller must drop below $300 before home users begin buying them en masse. Prices are currently at the $700 mark and should fall to $500 by the end of this year. When CD drives reach the critical $300 mark, sales should skyrocket, and so should CD-ROM. **PC**

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How to Write for *COMPUTE!'s PC Magazine*

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We depend on outside writers and programmers for much of our magazine's contents, but please note that, except for programs, we do not accept unsolicited material. Address editorial inquiries to COMPUTE! Publications, Suite 200, 324 West Wendover Avenue, Greensboro, North Carolina 27408. Here's how to submit the kinds of material that we use.

Features

We're looking for interesting and entertaining how-to articles, features, and tutorials. Articles should be aimed at beginning to intermediate home or small-business users with MS-DOS machines. The length of our articles varies from 1500 to 4000 words, and our pay is competitive. If you're an experienced writer with an idea that you think would interest our readers, send a query letter with writing samples to Clifton Karnes, Editor.

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We publish as many as 20 reviews per issue with a length that varies from 750 to 1200 words. We're always looking for qualified reviewers for both software and hardware, but we don't accept unsolicited reviews. If you're interested in writing a review for us, send a query letter with writing samples, software interests, and system specifics to Tom Netsel, Assistant Features Editor.

Original Programs

Many of *COMPUTE!'s PC Magazine* disks contain MS-DOS programs written by freelancers. We're looking for original, professional-quality applications with easy-to-use interfaces. High-quality games are always welcome. Send a disk with your program and a detailed article describing it to David Hensley, PC Disk Submissions.

Shareware Programs

Our "Best of the Boards" department is interested in exciting new public domain and shareware programs. We pay shareware authors a one-time fee and distribute their programs complete with registration requests. Submit your program, documentation files in pure ASCII, and a short ASCII file with your name, address, telephone number, and the hours you can be reached at that phone number to George Campbell, Contributing Editor, 1472 Sixth Street, Los Osos, California 93402. If you'd prefer to send your files by modem, drop George a note by mail or take a look at "Calling All Shareware Authors" in his January 1989 "Best of the Boards" column.

Style

We're much more concerned with the content of your writing than with its style, but it's important that your writing be clear and concise. These guidelines will help us edit and publish your ideas more easily.

Reviews and features should be written in the present tense and in active rather than passive voice. Paragraphs should be kept short, and it's OK to use contractions.

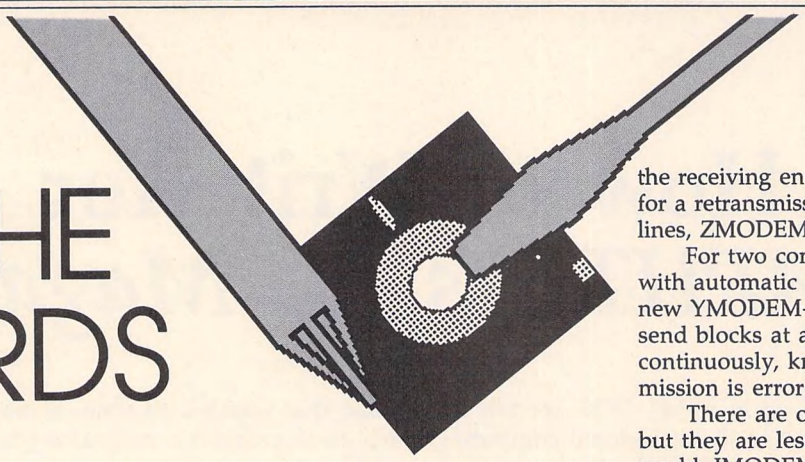
We prefer a short, snappy lead paragraph that hooks readers and makes them want to read more. Things we don't like are long, rambling sentences and a wide assortment of punctuation marks. Periods, commas, and dashes are our punctuation mainstays. Use parentheses, exclamation marks, and quotation marks sparingly.

If you're reviewing a piece of software or hardware, remember that a review is your opinion of a program. If you like it, tell the reader *why* you like it. Write as if you were telling a friend about a particular piece of software, in a conversational and informal manner. Unfortunately, some writers simply list the program's features and little else. Tell what you like about the program and what you don't like. Does the software succeed at what it was designed to do?

Feel free to be creative with your writing. Computer-related information is often straightforward, but it doesn't have to be dull. Then again, don't try hard to be cute or self-consciously clever.

In matters of grammatical style, we tend to follow the guidelines in *The Chicago Manual of Style*, available at most public libraries. Another useful book is *The Elements of Style* by Strunk and White. Even if you've read it before, Strunk and White is well worth rereading. **PC**

BEST OF THE BOARDS



George Campbell

In April, I attended the famous West Coast Computer Faire in San Francisco. The show, which has the reputation of being a place where innovation is king, has been an annual event since the beginning of the PC age. This year's show, however, was a mere shadow of its former self, with no astounding new products or announcements of hardware breakthroughs. As the corporate community assumes more and more economic control over hardware and software, down-home shows like this one are fading.

One trend surprised me, though. I'm sure it surprised many of the other exhibitors as well. There were about a dozen shareware distributors at the Faire selling programs on disk. Each of these booths had people lined up six deep, all clamoring to buy the latest versions of shareware programs.

This is more evidence that consumers are accepting the shareware concept, choosing to try programs before they buy them. The popularity of the shareware exhibits should cause commercial shareware publishers to sit up and take notice. None of this will come as a surprise to readers of "Best of the Boards," who already know the value of shareware software.

File-Transfer Protocols

On any busy BBS, some of the most frequently asked questions have to do with file-transfer protocols. What are they? Which is the best one to use?

First, file-transfer protocols are the tools that allow us to transfer files without errors. Since a DOS program can't run if there is a single byte out of place, transfers must be error-free. Over the years, several methods have evolved to ensure accurate data transmission.

One file-transfer option on most bulletin boards is ASCII. This method uses no error correction at all. An ASCII transfer simply sends the data as is. It's useless for binary files, but works for sending messages and E-mail. Even with text files, an error-checking protocol is better, ensuring accuracy.

XMODEM, the oldest protocol, sends a single 128-byte block of a file and then sends a checksum number based on the data in that block. The receiving computer calculates a new checksum for the received data. If the two match, the receiving computer sends a signal back asking for the next block of data. If the two don't match, a different signal asks for the block to be repeated. On a quiet phone line, repeats are seldom necessary.

XMODEM/CRC uses the same basic system but performs a more precise examination of the data for errors. Again, if the 128-byte block is correct, the transfer proceeds. If there's an error, the block is resent.

XMODEM-1K can use either the checksum or CRC method for error checking. The difference is that XMODEM-1K, sometimes called YMODEM, sends its data in blocks of 1024 bytes. Since more data is transmitted before checking, transfers are faster.

True YMODEM, often called YMODEM BATCH, uses the same basic system as XMODEM-1K, sending 1024 bytes in each block. Unlike the others, however, YMODEM can send multiple files. It does this by sending each file's filename just before beginning the transfer. The receiving computer's version of YMODEM records the files. This eliminates the need to start a new transfer for each file.

ZMODEM, the latest entry in the protocol list, goes YMODEM one better. It uses all the speed-up tools such as multiple files and 1K blocks, but it adds another technique. Instead of requiring the receiving computer to verify each block, it assumes that the blocks are error-free. Only if there is an error does the receiving end send a message asking for a retransmission. On clean phone lines, ZMODEM is the fastest of all.

For two computers using modems with automatic error correction, the new YMODEM-G protocol doesn't send blocks at all, but sends the file continuously, knowing that the transmission is error-free.

There are other protocols as well, but they are less common in the BBS world. JMODEM, IMODEM, and others are still in their infancy.

Which protocol should you use? On clean phone lines, ZMODEM is the fastest, often reaching 99-percent efficiency in file transfers. YMODEM is available on almost all BBSs and is nearly as fast, hitting the 90-percent efficiency mark. The old classic, XMODEM, usually manages to reach 75-percent efficiency. On noisy phone lines, however, its smaller block size can mean less errors and less time needed to resend blocks of data.

All the protocols guarantee error-free file transfers. Use the one that best suits a particular communications session. Just make sure both computers are using the same protocol.

Search for a Free BBS

More and more bulletin board sysops are opting to charge a small fee for access to their systems. While this is understandable, given the costs of operating a BBS, it can be discouraging to users who are trying to economize by finding systems that don't charge.

Following is a short list of excellent BBSs around the country that charge no access fee. All of them offer a variety of files for downloading and can communicate with 2400-baud modems.

The list includes at least one BBS for each region of the country, so there's bound to be one close to you. Most of these systems allow you to download files the first time you call.

Eastern

Florida	PcLogic; (407) 338-8486; sysop: Bill Wright.
Maine	The Witch BBS; (207) 989-3737; sysop: Jim Troutman.
Maryland	The Waldorf Connection; (301) 843-1548; sysop: Joe Sartori.
Michigan	Systek; (313) 522-3164; sysop: Dick Horner.
Ohio	J & J's; (513) 236-4788; sysop: Joe Caplinger.

This Issue's Programs

DOS Help

Whether you're a complete novice or an experienced power user, there are times when you can't remember exactly how to use a particular DOS command. Normally, that means digging out your DOS manual. *DOS Help*, written by John Crouch, a Maryland programmer, will put an end to your confusion.

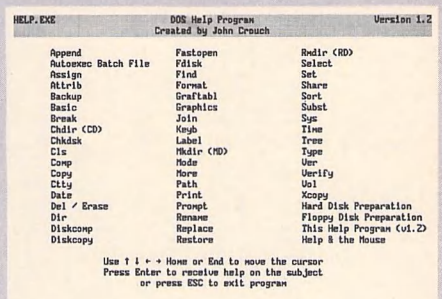
Help is one of the fastest and easiest ways available to get help on DOS commands. Just give the command HELP, and a menu of DOS commands and other subjects appears on your screen. You can use your cursor keys to highlight one of the commands and then press Enter to view one or more screens of information about that command.

If you have a mouse, the process is even simpler: Just move the mouse cursor over a command and click the mouse button to view the information. Since the program is written for DOS 3.3, some of the commands won't apply if you have an earlier version of DOS.

If you're in a real hurry, you can bypass the menu screen altogether by adding the name of a DOS command when you start the program. For example, the command HELP COPY gives you instant help about the COPY command.

Help, unlike some similar programs, isn't memory-resident. Since you almost always want help with commands while you're at the system prompt, there's no need to waste valuable memory. When you exit the program, it restores your original screen.

To run *Help*, you'll need at least one floppy disk drive and 128K of RAM. The program can use any monitor. The author requests a $15 contribution if you find *Help* useful.



Look up system commands with DOS Help.

QDups

Hard disks are wonderful. They let you store what seems to be an unlimited amount of data. Unfortunately, most users fill up their hard disks much faster than they expect. Instead of looking through directory after directory for files to delete, why not use *QDups?*

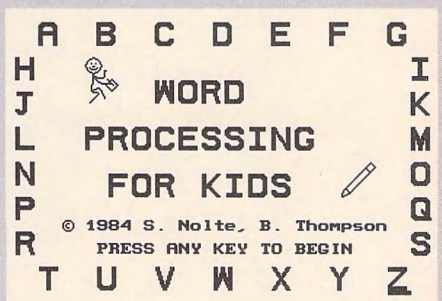
Written by Canadian author Claude Biron, this program searches through one or more hard disks, looking for duplicate files. Once it finds them, it gives you the opportunity to selectively delete the unnecessary duplicates.

You'll probably be amazed at the number of times you have created more than one copy of a file. The first time you use *QDups*, you might free as much as 20 percent or more of the space on your disk. If you use the program regularly, you'll never waste disk space with duplicated files.

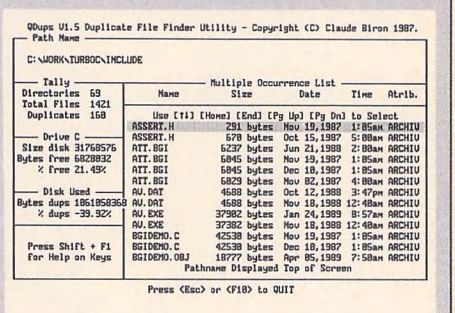
QDups starts by reading your hard disk's directory, displaying each filename as it searches. When it finds another file with the same name, it lists that filename in a second window. After having looked at the entire disk, the program shows you a list of duplicate files, letting you scroll through them. Any time you like, you can delete a file with a single keystroke. All the information you need is right on the screen.

The program offers other choices. If you're unsure whether two files are identical, you can compare them, byte for byte. *QDups* can also print a list of your duplicate files for later reference or write the list to an ASCII file. If you have more than one hard disk or a large disk divided into multiple partitions, the program can look for duplicate files on all your disks. Help is always available for the program's commands.

QDups needs one or more hard disks, at least 256K of RAM, and a monochrome or color monitor. The more memory, the better. If you have a full 640K, the program can handle two 20MB hard disks easily.



Word Processing for Kids *is easy to use.*


QDups V1.5 Duplicate File Finder Utility - Copyright (C) Claude Biron 1987.
Path Name
C:\WORK\TURBOC\INCLUDE
Tally
Directories 69
Total Files 1421
Duplicates 150
Drive C
Size disk 31768576
Bytes free 6828032
% free 21.49%
Disk Used
Bytes dups 18618368
% dups -39.92%
Press Shift + F1
for Help on Keys
Multiple Occurrence List
Name Size Date Time Atrib.
Use [↑↓] [Home] [End] [Pg Up] [Pg Dn] to Select
ASSERT.H 291 bytes Nov 19,1987 1:05am ARCHIV
ASSERT.H 670 bytes Oct 15,1987 5:00am ARCHIV
ATT.BGI 5237 bytes Jun 21,1988 2:00am ARCHIV
ATT.BGI 6845 bytes Nov 19,1987 1:05am ARCHIV
ATT.BGI 6845 bytes Dec 18,1987 1:05am ARCHIV
ATT.BGI 6829 bytes Nov 02,1987 4:00am ARCHIV
AV.DAT 4588 bytes Oct 12,1988 3:47pm ARCHIV
AV.DAT 4588 bytes Nov 18,1988 12:40am ARCHIV
AV.EXE 37982 bytes Jan 24,1989 8:57am ARCHIV
AV.EXE 37382 bytes Nov 18,1988 12:40am ARCHIV
BGIDEMO.C 42538 bytes Nov 19,1987 1:05am ARCHIV
BGIDEMO.C 42538 bytes Dec 18,1987 1:05am ARCHIV
BGIDEMO.OBJ 18777 bytes Apr 05,1989 7:50am ARCHIV
Pathname Displayed Top of Screen
Press <Esc> or <F10> to QUIT

Zap duplicate files with QDups.

QDups is a shareware program. If you use it regularly, please honor the author's request for a $15 registration fee.

Touch Type Tutor

How are your typing skills? If you're like many users, you could use a bit of brushing up. In fact, a surprising number of active PC users don't have touch-typing skills at all. Few things can help your productivity more than becoming a fast, accurate typist.

TTT, short for *Touch Type Tutor*, is an excellent way to learn to type or to improve your rusty skills. Written by David Gray, it's easy to use and even fun.

The program offers three modes. First, you can use the tutorial mode and learn to type from scratch. Here, you proceed through a series of lessons that teach you basic typing skills, concentrating on just a few letters at a time. Keyboard diagrams help you learn which keys work with which fingers. After you've mastered each phase of the tutorial, *TTT* records your progress, automatically moving you to the next level.

Next is the speed-testing mode, where you can practice your new skills using text similar to the kind you will type in your job or hobby. Your speed is accurately measured, and the text examples are short enough to prevent boredom. You can also create other samples with a text editor.

Finally, there's even a game mode, with five levels of difficulty. You must type the letters that appear on the screen as fast as possible to keep from being speared at the end of a conveyor belt. It's fun and effective for learning key positions.

TTT requires just one floppy disk and a minimum of 128K of memory and will work with any monitor. The author requests a $10 shareware registration fee.

Word Processing for Kids

WPK, short for *Word Processing for Kids*, is the answer to every parent's dream. Normal word processors are too complex for elementary school students. They use too many difficult commands to be fun. Written by Texas programmer Sidney Nolte, *WPK* is designed just for kids, with color icon menus and large type on the screen. Just a few keys control the program, making it easy and fun to use.

The program starts with a musical alphabet. Then the budding writer sees a simple menu, allowing him or her to choose whether to write a new story, load one written earlier, print a story, or quit the program. The cursor keys do all the work.

As the child types, the text appears in oversized letters for easy reading. The normal cursor keys move the cursor around the screen and the Esc key returns to the menu. The Backspace and Del keys delete characters, while the Ins key toggles between insert and overtype modes. Young users can get help at any time by pressing F1.

When the time comes to print out a story, the size of the type depends on the screen display. If the large typeface shows, the printout uses large type. The smaller screen font prints in normal-sized type. Naturally, the stories can be saved to disk.

WPK is an excellent way to introduce children to your PC and to the idea of word processing. They'll have fun and learn valuable skills in the process.

WPK requires only 128K of RAM and a single floppy drive. It requires CGA, EGA, or VGA graphics, but users with Hercules-compatible systems can use the program by loading CGA.COM, included on the disk. Printouts require an Epson-compatible printer for the large type. Most dot-matrix printers support the simple commands used in *WPK*.

The author requests a modest $10 registration fee. If you use this valuable learning tool, please contribute to help develop other programs like this one. — *G.C.*

Central

Louisiana	Silverado; (318) 238-3389; sysop: David Silver.
Nebraska	Flite-Line; (402) 421-2434; sysop: Steve Cox.
Tennessee	The Disk Fix; (615) 983-8232; sysop: Tom Wallace.
Texas	Rio Grande Net; (915) 592-4976; sysop: Jon E. Schneider.

Mountain

Colorado	Wildcat Orphanage; (719) 392-6631; sysop: Robert Connors.

Pacific

California	The Power Station; (707) 552-0462; sysop: Joe Martin.
California	SLO Bytes BBS; (805) 528-3753; sysop: George Campbell.
Washington	The Signpost; (206) 547-0167; sysop: Dave Halliday.

This is just a short list. To find more systems in your area, download the file USBBS.LST, or a variation of that name, from these or other BBSs. It's a list of hundreds of systems nationwide.

When you call, be sure to leave messages for the sysops letting them know what a good job they're doing. If you download files, upload some of your favorites. That's what makes the BBS community grow. Users who only download files soon become unwelcome on most systems.

The Shareware World: What's Hot

Two of the most powerful communications programs anywhere are *Qmodem* and *Boyan*. Both have been upgraded to version 4.0, making them more valuable than ever.

Qmodem now offers new features like a BBS-style host mode to let others call your system, improved menus and help screens, plus automatic log-on script learning. An excellent tutorial is included to help get you started. *Qmodem* 4.0 is available for downloading on GEnie and CompuServe, or you can order a trial copy direct from The Forbin Project for $15. Contact The Forbin Project at P.O. Box 702, Cedar Falls, Iowa 50613.

Boyan 4.0 is good competition for *Qmodem*, with most of the same easy-to-use features. There's no tutorial program, but *Boyan* includes a powerful DOS shell to make your file operations easy. The whole program fits on two floppy disks—compared to *Qmodem*'s five—and *Boyan* is much easier to use if you don't have a hard disk. It's also available on GEnie and CompuServe, or you can download it directly from the author's BBS at (919) 682-4225. **PC**

HOW TO USE THE DISK

Every issue of *COMPUTE!'s PC Magazine* includes a 5¼- or 3½-inch disk (newsstand copies contain 5¼-inch disks only; subscribers get their choice). If you experience a problem with the disk, please contact us at (919) 275-9809 between 9:00 a.m. and 4:30 p.m. EST, Monday through Friday.

Before you begin using the magazine disk, we highly recommend making a backup copy and keeping the original in a safe place. Follow the instructions below.

Computers with One Floppy Disk Drive:

Put your DOS disk into the drive and enter DISKCOPY. Then follow the instructions on the screen.

Computers with Two Floppy Disk Drives:

Put your working copy of DOS into drive A and enter DISKCOPY A: B: at the DOS prompt. When DOS prompts you, remove the DOS disk from drive A and replace it with the magazine disk. Put a blank disk into drive B and press any key to make the copy.

Running Magazine Programs

Descriptions of all the files on the disk are contained in a file named README. You can display this file on the screen by entering TYPE README at the DOS prompt. Press the Ctrl-S key combination to stop scrolling. You can restart scrolling by pressing the space bar (or any other key). (Some computers have a special Pause key for this purpose.) You can read the file more easily by loading it into your word processor or by printing it with the DOS command COPY README PRN.

Before running the disk programs, follow the instructions in the articles. Remember that some files on the magazine disk are not executable programs; for instance, some files may contain only the data for a program.

Compressed Files

Programs on the disk are sometimes compressed and stored as self-extracting archives. It's easy to identify these files—they all begin with a hyphen (-) and have an EXE extension.

It's a simple process to uncompress an archive. If you're a beginner, or if you just want to keep things as simple as possible, follow the instructions under "All Computers," below. If you're a more advanced user, you can follow the instructions under "Computers with One Floppy Disk Drive," "Computers with Two Floppy Disk Drives," or "Computers with Hard Disk Drives," depending on your equipment's configuration.

Just be sure not to try to extract a compressed file onto a copy of the magazine disk—there probably isn't enough space on the disk for the files.

All Computers:

▶ Copy the compressed file to a newly formatted disk.

▶ Put that disk into drive A.

▶ At the A> prompt, type the archive name.

Computers with One Floppy Disk Drive:

▶ Have a disk ready for your extracted files.

▶ Put the disk that contains the compressed file into your drive.

▶ At the A> prompt, type *-archive* B:, substituting the name of the compressed file for *-archive.*

▶ Follow the computer's instructions to swap disks.

Computers with Two Floppy Disk Drives:

▶ Put the disk that contains the compressed file into drive A.

▶ Put the disk where you want the extracted files into drive B.

▶ At the A> prompt, type *-archive* B:, substituting the name of the compressed file for *-archive.*

Computers with Hard Disk Drives:

▶ On your hard disk, make a directory for the files by changing to your hard disk and entering the command MD *directory,* substituting your own directory name for *directory.*

▶ Put the disk that contains the compressed file into drive A.

▶ At the A> prompt, type the command *-archive C:\directory,* substituting the name of the compressed file for *-archive* and the names of your hard disk drive and directory for *C* and *directory.*

Directories

Program files are sometimes stored on the disk in directories. You can easily identify directories by typing the DIR command. In the DIR listing, directories are indicated with a <DIR> beside each directory name. If the program is in a directory, simply change to the directory with the command CD *directory* (substituting the directory name for *directory*) before you run the program. To return to the root directory, type CD \.

Programs That Require DOS

Some programs on PCs and compatibles require COMMAND.COM (a DOS file) to operate. Floppy drive systems look for COMMAND.COM on drive A, so it's best to keep a disk with COMMAND.COM in drive A. If there's room on your backup copy of the magazine disk, you can copy COMMAND .COM onto it and run the magazine programs from drive A. If there isn't room, put a COMMAND.COM disk in drive A and the backup copy of the magazine disk in drive B. Then run the magazine programs from drive B.

If the system you're using has one floppy drive and no hard drive, copy COMMAND.COM onto your backup disk, if there's room. If there isn't room, copy some of the programs you want to use from your backup disk to a disk with COMMAND.COM. Then run the programs from that disk.

If the system you're using boots from a hard drive, the computer can find COMMAND.COM on the hard drive. If you boot a hard drive system from a floppy disk in drive A, you should keep a COMMAND.COM disk in drive A.

More Tips

▶ Be sure that your graphics system (Hercules, CGA, or EGA) matches the program requirements.

▶ Don't be concerned that your PC disk might have a virus. We get a disk with the latest version of each program directly from the author, and we run a battery of tests on each file to ensure that it's virus-free.

▶ If you can't display a directory of the disk with the DIR command, the disk is probably defective. Return your disk to us, and we'll quickly send you a replacement.

With the exception of the featured programs in our "Best of the Boards" column, the entire contents of *COMPUTE!'s PC Magazine* and the disk are copyright 1989 by COMPUTE! Publications, Inc., all rights reserved. The programs are intended for use by the purchaser of the magazine and may not be distributed to others in any form. We ask that you respect the copyright. **PC**

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* Single disks for *COMPUTE!'s Gazette* are $15.00. Disk/magazine combinations are $16.00 NOTE: No disks dated prior to June 1986 are available. The May 1986 and October, 1987 *Gazette* disks are no longer available.

* Back issues of *COMPUTE!'s PC Magazine* are $16.00 each. This publication is available only as a magazine/disk combination. Our back issue inventory consists mainly of magazines with 5.25-inch disks, but we will attempt to supply 3.5-inch disks if requested. The following issues are **NOT** available: ***PC Magazine:*** 9/87, 11/87, 9/88.

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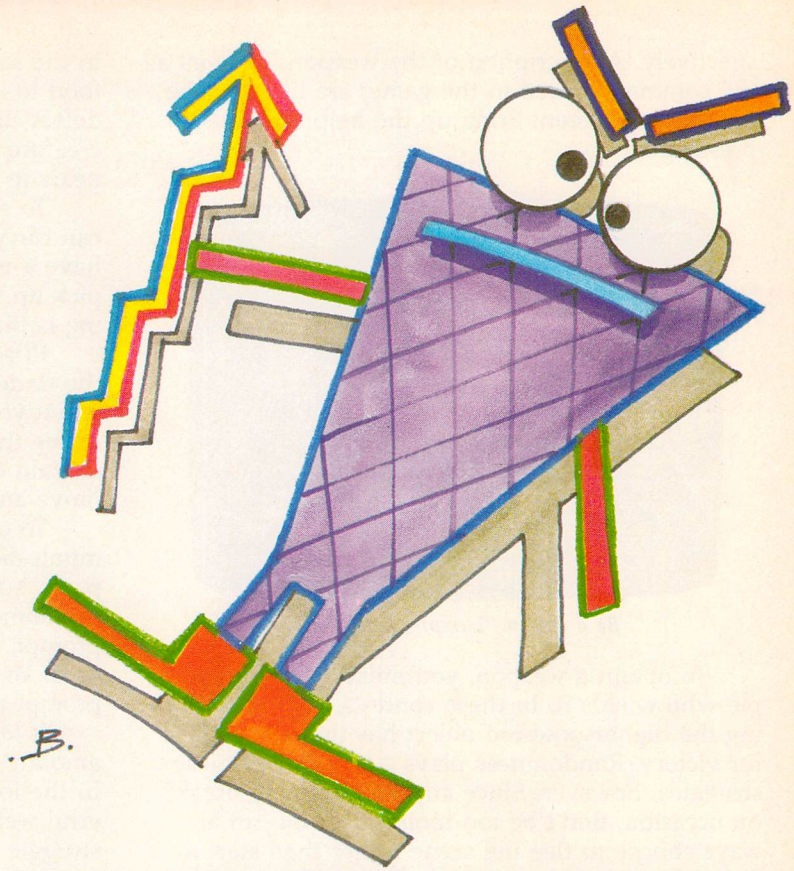
Lumpies of Lotis IV



John and Jeff Klein

This whimsical game casts you in the role of a spy on a hostile planet and features a realistic, 3-D maze. It runs on any IBM PC, XT, AT, or compatible with 256K, DOS 2.1 or higher, and CGA, EGA, or VGA graphics.

When "Lumpies of Lotis IV" begins, intergalactic cargo ships have been hijacked near the planet Lotis IV, and an economic crisis threatens the galaxy. Lotis IV is inhabited by Lumpies—a primitive but cunning tribe of creatures who live underground. Your mission is to spy on the Lumpies and discover whether they're indeed hijacking the cargo ships. If the Lumpies have taken prisoners from the crews of the missing ships, you must free the captives as well.

During your approach to Lotis IV, a severe atmospheric storm sends your spacecraft plummeting to the planet's surface. When your mind clears after the accident, you find yourself wandering in a maze of underground caves, without any weapons or communications gear. Your only hope for survival is to find the Lumpies' communications center so you can summon a rescue team from home—freeing any prisoners you find on the way.

3-D Adventure

The screen displays two different views of your adventure. The right side of the screen displays a map of the current level of the Lumpies' extensive system of caverns. The map shows only the rooms that you've already visited. The plus signs located along the maze map indicate doors. A door may lead into a room or into another tunnel. The arrow on the map shows your present location and the direction you're facing. Appearing on the left side of the screen is a 3-D view of what's in front of you.

The game is played entirely with keyboard controls. To move or change direction, press the appropriate cursor key. The cursor-left and -right keys move you left and right, respectively. The cursor-up key moves you forward (in the direction you're facing), and the cursor-down key reverses your direction 180 degrees.

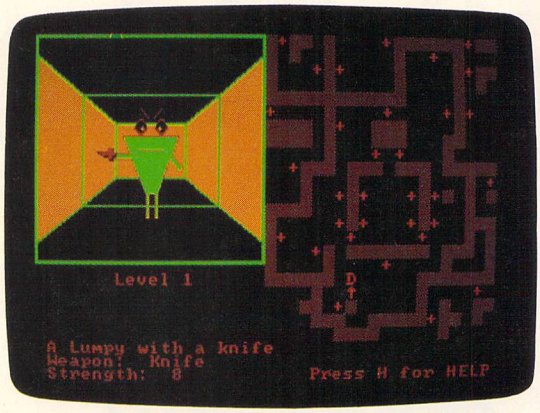
To go through a doorway, you must break the door by pressing B. Pressing the H key provides the online help screen. The T, F, and R keys let you, respectively, pick up a weapon, fight a Lumpie, or run from a fight. To toggle the sound, press the S key. When you encounter a ladder, press D to go down to the next level or U to climb up to the previous level. To quit the game at any time, press Q.

You start with a strength rating of 20 and no weapons in your possession. Your strength decreases by a factor of 1 when a Lumpie hits you during a fight. To replenish your strength, enter a cave that contains food. Don't let your strength dwindle to 0; if that happens, your mission ends immediately.

Unearthly Contests

In the peculiar world of Lotis IV, most of the weapons are primitive (knives, bows and arrows, axes, and swords), but some Lumpies have acquired weapons from the hijacked cargo ships (bombs and guns). Each object's power is rated on a scale of 1 to 6, and the power rating is more important than the object's description. A gun has a power rating of 6, while a knife, a bow and arrow, an ax, a sword, and a bomb range in power from 1 to 5, re-

spectively. A description of the weapons, as well as the commands used in the game, are listed in the online help screen. Bring up the help screen by pressing H.



Be a spy in "Lumpies of Lotis IV."

To obtain a weapon, you must defeat the Lumpie who wields it. In these contests, the one holding the higher-powered object has the best chance for victory. Randomness plays a key part in these struggles, however. Since any weapon may break on occasion, don't be too foolhardy: You can always choose to flee the scene rather than start a fight or continue one that's going badly.

If you flee from a fight, the Lumpie retains the number of hits it received in the fight and remains in the same location. If you must retreat, search for food to increase your strength and then return to defeat the Lumpie. When you defeat a Lumpie, the creature surrenders its weapon to you and disappears in humiliation, never to return to the caves.

To acquire the weapon, press T (Take). You can carry only one weapon at a time. If you already have a weapon, it's replaced by the weapon you pick up. It's best to take a weapon if its power rating is higher than the weapon in your possession.

Prisoners are found at various locations within the underground maze; they're freed automatically when you encounter them. Look at the help screen to see the number of prisoners you've freed so far. Certain caves also contain ladders that allow you to move among the six levels.

To complete the game, you must find the communications room and call home to request a rescue party. You can free additional prisoners after calling the home planet by pressing I (Ignore) at the prompt, but you won't win until you return to home base. You do this by pressing H (Home) when the prompt asks whether you want to go home.

It takes considerable skill (and a certain amount of luck) to complete the game successfully. In the lower levels, the Lumpies use the more powerful weapons. If you and a Lumpie engage in a struggle with objects of equal power, the outcome is unpredictable. The map layout remains much the same each time you play, so with a little practice you can learn the best route to victory. **PC**

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Gold Rush!

Bob Gingher

The California Gold Rush practically defined American adventure. In 1849, the lure of California gold inspired a new national destiny, and nearly a quarter of a million prospectors left their homes and headed west to find their fortune.

Now, program designers Doug and Ken MacNeil have packed the excitement of this national ecstasy into *Gold Rush!*, a new 3-D animated game for the PC.

FAST FACTS

Title:	*Gold Rush!*
Category:	Graphics-based adventure game
Features:	Three travel routes; on-screen travel maps; 150 scenes; capsule histories and geography lessons
Requirements:	IBM, Tandy, or compatible PC; 256K; DOS 2.0 or higher
Publisher:	Sierra On-Line P.O. Box 485 Coarsegold, CA 93614
Price:	$39.95

The basic scenario for *Gold Rush!* is straightforward: City slicker Jerrod Wilson, weary of his nine-to-five job, in New York, decides to follow his brother Jake out west to the heart of the gold country. You become young Jerrod in, as the manual puts it, "an interactive movie in which you become the main character."

Gold Digger

Before you actually get started, you must successfully answer a gold-rush trivia question using the accompanying 88-page mini history, California Gold: Story of the Rush to Riches, by Phyllis and Lou Zauner. Fail and your character is summarily hanged in vivid graphics. Don't worry though—the program gives you both the page and paragraph that contain the answer (this is the game's copy-protection method).

The year is 1848, just before the mad gold rush. Jerrod stands on a narrow footbridge spanning a waterfront canal in Brooklyn Heights, New York. Wagons, passersby, and sea gulls add to the realism. The animated graphics and attention to detail create an eerie sense of place.

In *Gold Rush!*, you must plan carefully. Before leaving home, you have to come up with the money to pay for steerage or overland passage to California and decide what you'll need to bring along. You should unload your property while it's still a seller's market and buy your steamer or stagecoach ticket before prices go too high.

Along the way, you pick up points for taking certain routes, writing in shrewd questions, and taking on useful inventory. Look around, talk to people, and read the available documents. That's the only way to gather the answers and clues you'll need to find Jake in California.

California or Bust

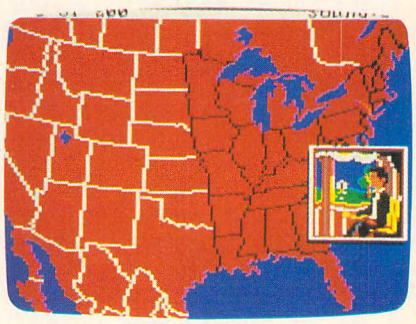
You can choose three mid-nineteenth-century travel routes from the East to the West Coast. The first route takes you by stagecoach, canal boat, steamer, and wagon train through the American heartland; the second route goes by ship from the Gulf Stream to Panama, and then by foot through the cruel Central American jungle; and the third route moves by ship via Cape Horn (this route covers nearly 18,000 miles). Inset windows and convincing nineteenth-century travel maps let you know just where you are on your journey.

Depending upon which route you take, you'll encounter Indians, cattle rustlers, jungle quicksand, snakes, poisonous plants, vicious jungle ants, starvation, or scurvy. Since it's easy to repeat your mistakes in *Gold Rush!*, be sure to save your game often. That way you can restart at level Y, instead of level A, when you get wiped out at level Z.

You journey through each of the scenes by moving to the four edges of the screen. This way, the 150 scenes become a series of interconnected locales. The scenes include seascapes, jungles, the Great Plains, and areas both outside and inside stores, mining camps, institutions, and a steamer at sea.

Leaving Home

Near the first harbor scenes, you find Jerrod's house, a city park, the stable, a post office, a bank, and both a hardware and a grocery store. You can go into many of the buildings. Before selling your house, you should explore it and keep any memorabilia that you might need.



Go west in Sierra's Gold Rush.

I do have one recommendation. At 4.77 MHz, the scene changes can take as many as ten seconds. If you stumble on the trek as often as I did, you'll appreciate a faster machine. Even though they can be slow, the graphics in *Gold Rush!* are remarkable, especially when viewed in EGA and VGA. In a storm sequence around Cape Horn, coal stokers fed the boiler as the ship moved past rocks, reefs, and icebergs, with the rough water violently shaking the ship. While all this was going on, I could still move from bow to stern, or from galley to boiler room, and talk with the terror-stricken crew.

Travel Far

Gold Rush!'s capsule histories and geography lessons make this entertaining program both informative and authentic. Kids of any age will soon be talking about the Great Plains and the routes to Panama and around Cape Horn.

Interactive computer games succeed when your decisions and their consequences both become an integral part of the program. As in real life, we like to see the results of our decisions. The MacNeil brothers have used this principle as a guide in their exceptional design of this program. *Gold Rush!* is a pleasurable journey that deserves a strong thumbs-up. ▷

Twist & Shout

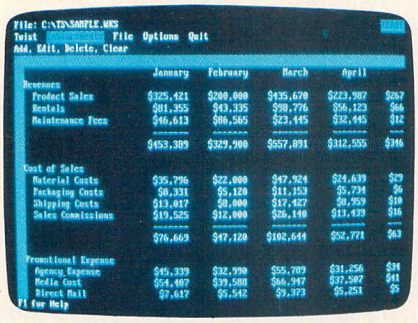
Ervin Bobo

No, it's not a song by the Isley Brothers, the Beatles, or Ferris Bueller, but a program designed to print spreadsheets and text files across the long dimension of your printer paper. (OK, the Twist part of the program prints spreadsheets *sideways*—even if it's the name of another program. After all, *Twist & Shout* is designed to go head-to-head with *Sideways* and even improve on it.)

Despite the two-part name, the program is, in fact, divided into three parts. An install program makes working copies of the master disks, leaving you with two disks: One contains Twist; the other contains Shout and the print spooler. The installation procedure presents you with a number of menu options, including number and type of drives (*Twist & Shout* can be installed on a hard disk), printer type (over 500 printers are supported, including ink-jet and LaserJet printers), and output port (LPT or COM).

Twist reads files created with *Lotus 1-2-3*, *Symphony*, and *Quattro*, as well as ASCII files created with other programs. It can be used as a stand-alone program, but it's used primarily as a *Lotus* accessory. As such, it can be added to your working copy of *Lotus* or *Quattro*, but this is recommended only for the more experienced user.

After you've selected the menu options, the copying process begins, and the information on the two master disks is redistributed onto two working disks. Since the install program is also copied to the working disks, you can re-install the program if there are any changes.



Twist & Shout *takes wide spreadsheets, spins them around, and prints them sideways using almost any dot-matrix or graphics printer.*

Twist to the Left

So what does Twist do? Many people have spreadsheets that are too wide but not especially long (being a maverick, I always make mine the opposite). Wide spreadsheets can only be printed on two or more vertical pages, which are then pasted together side by side to form the complete spreadsheet. Twist twists the electronic sheet by turning it 90 degrees during the printing process. It doesn't matter how wide your sheet is: Twist continues printing sideways across the perforations until the job is done.

While the width of the sheet (the columns) is limited only by your supply of paper, the height is subject to some restrictions. Using Twist's default font and no margins, you'll get about 50 lines (rows) to a sheet. This isn't too much of a handicap, since conventional printing would limit you to about 60 rows. You've lost 10 rows, but you've gained an enormous number of columns.

Twist's working screen is similar to *Lotus 1-2-3's*. Options are presented horizontally across the top of the screen, with the cursor highlighting the current selection. An option is selected by pressing Enter, which causes a submenu to appear. You'll find the familiar *wait* in the upper right corner of the screen and a message bar at the bottom of the screen.

The F1 key functions as a Help key, bringing up a window at the bottom of the screen explaining how to use the currently selected option. The cursor keys allow you to scroll through the help messages, while Enter lets you exit.

If that were all Twist did, it would be enough for most of us, but there's more. There are editing functions, but don't be fooled—Twist isn't a spreadsheet and will not recalculate if you change a number. There are also enhancements to the printed text. You can choose bold, italics, underline, or any combination of the three, and if you have a printer capable of color, you can also choose the color of the print.

You can twist files with the suffixes .WKS, .WK1, .WRK, and .WR1, which covers spreadsheet programs such as *Lotus, Symphony, Quattro, VP-Planner, SuperCalc,* and many more. You can also twist text files from word processors and databases.

	January	February	March	April	May	June	July	August	September	October	November	December	Totals
Revenues													
Product Sales	$325,421	$200,000	$435,670	$223,987	$267,890	$298,004	$321,558	$323,668	$340,997	$222,456	$376,555	$287,659	$3,623,865
Rentals	$81,355	$43,335	$90,776	$56,123	$66,489	$64,559	$48,711	$75,431	$55,986	$32,445	$68,432	$55,447	$747,089
Maintenance Fees	$46,613	$86,565	$23,445	$32,445	$12,338	$12,568	$22,997	$18,997	$22,225	$14,845	$18,776	$9,854	$321,668
	$453,389	$329,900	$557,891	$312,555	$346,637	$375,131	$393,266	$418,096	$419,208	$269,746	$463,763	$352,960	$4,692,542
Cost of Sales													
Material Costs	$35,796	$22,000	$47,924	$24,639	$29,468	$32,780	$35,371	$35,603	$37,510	$24,470	$41,421	$31,642	$398,625
Packaging Costs	$8,331	$5,120	$11,153	$5,734	$6,858	$7,629	$8,232	$8,286	$8,730	$5,695	$9,640	$7,364	$92,771
Shipping Costs	$13,017	$8,000	$17,427	$8,959	$10,716	$11,920	$12,862	$12,947	$13,648	$8,898	$15,062	$11,506	$144,955
Sales Commissions	$19,525	$12,000	$26,140	$13,439	$16,073	$17,880	$19,293	$19,420	$20,460	$13,347	$22,593	$17,260	$217,432
	$76,669	$47,120	$102,644	$52,771	$63,115	$70,210	$75,759	$76,256	$80,339	$52,411	$88,716	$67,772	$853,783
Promotional Expense													
Agency Expense	$45,339	$32,990	$55,789	$31,256	$34,664	$37,513	$39,327	$41,818	$41,921	$26,975	$46,376	$35,296	$469,254
Media Cost	$54,407	$39,588	$66,947	$37,507	$41,596	$45,016	$47,192	$50,172	$50,305	$32,370	$55,652	$42,355	$563,105
Direct Mail	$7,617	$5,542	$9,373	$5,251	$5,824	$6,302	$6,607	$7,024	$7,043	$4,532	$7,791	$5,930	$78,835
	$107,363	$78,120	$132,109	$74,013	$82,084	$88,831	$93,125	$99,085	$99,268	$63,876	$109,819	$83,581	$1,111,194
Overhead													
Management	$54,407	$39,588	$66,947	$37,507	$41,596	$45,016	$47,192	$50,172	$50,305	$32,370	$55,652	$42,355	$563,105
Engineering	$4,534	$3,299	$5,579	$3,126	$3,466	$3,751	$3,933	$4,181	$4,192	$2,697	$4,638	$3,530	$46,925
Administration	$5,441	$3,959	$6,695	$3,751	$4,160	$4,502	$4,719	$5,017	$5,030	$3,237	$5,565	$4,236	$56,311
Equipment Rental	$1,953	$1,200	$2,614	$1,344	$1,607	$1,788	$1,929	$1,942	$2,016	$1,335	$2,259	$1,726	$21,743
Legal/Accounting	$4,661	$8,657	$2,345	$3,245	$1,234	$1,257	$2,300	$1,900	$2,223	$1,485	$1,078	$985	$32,167
Rent	$6,400	$6,400	$6,400	$6,400	$6,400	$6,400	$6,400	$6,400	$6,400	$6,400	$6,400	$6,400	$76,800
Telephone	$6,508	$4,000	$8,713	$4,480	$5,358	$5,960	$6,431	$6,473	$6,820	$4,449	$7,531	$5,753	$72,477
Depreciation	$7,044	$7,044	$7,044	$7,044	$7,044	$7,044	$7,044	$7,044	$7,044	$7,044	$7,044	$7,044	$84,528
Miscellaneous	$36,271	$26,392	$44,631	$25,804	$27,731	$30,010	$31,461	$33,448	$33,537	$21,580	$37,101	$28,237	$375,403
	$127,219	$100,538	$150,968	$91,899	$98,596	$105,728	$111,409	$116,576	$117,597	$80,596	$128,067	$100,266	$1,329,460
Totals													
Revenues	$453,389	$329,900	$557,891	$312,555	$346,637	$375,131	$393,266	$418,096	$419,208	$269,746	$463,763	$352,960	$4,692,542
Expenses	$311,250	$225,779	$385,728	$218,684	$243,795	$264,769	$280,294	$291,838	$297,204	$196,802	$326,603	$251,619	$3,294,436
Pre-Tax Profit	$142,139	$104,121	$172,171	$93,871	$102,842	$110,362	$112,972	$126,258	$122,004	$72,864	$137,160	$101,341	$1,398,106
Taxes	$42,642	$31,236	$51,651	$28,161	$30,853	$33,109	$33,892	$37,877	$36,601	$21,859	$41,148	$30,402	$419,432
Net Profit	$99,497	$72,885	$120,520	$65,710	$71,989	$77,254	$79,081	$88,381	$85,403	$51,004	$96,012	$70,939	$978,674

Shout a Message

Shout is an easy-to-use banner maker. With a means of printing sideways already provided, this is a logical add-in. You can print both long banners and signs in any of four fonts, with a maximum letter size of eight inches (the width of standard paper).

Shout produces banners with 1–6 lines of type. Since banners are rarely used for complex messages, multiple lines are used to make your banner shorter. As a single line with eight-inch letters, the traditional typewriter-testing line *Now is the time for all good men . . .* would stretch over 30 pages. If it were made six lines, you might get it all on one page, but it would then be a sign rather than a banner.

FAST FACTS

Title:	*Twist & Shout*
Category:	Printer utility
Features:	Sideways printing; print spooling; banner printing; mouse support; supplied with both 5¼- and 3½-inch disks
Requirements:	IBM, Tandy, or compatible PC with at least 384K RAM; DOS 2.0 or higher; dot-matrix or other graphics printer
Publisher:	Software Toolworks 13557 Ventura Blvd. Sherman Oaks, CA 91423
Price:	$59.95

Because of the many different computer/monitor combinations, Shout is not a what-you-see-is-what-you-get program. You'll be able to tell the font you're using because your text will be highlighted when its font is called up on the menu. But to really see what you'll get, you'll have to look at the pictures in the manual. The fonts available are Times Roman, Olde English, Sans Serif, and Script; and they can be mixed within a banner or within a single line on the banner. There's also a Symbols typeface, which provides you with 52 pictures that can be incorporated into your banner.

After you've selected a message and font, Shout provides three options for printing. Graphic mode gives high-quality, solid letters. Auto creates large letters from many small ones (an *A* would be formed from many smaller *A*'s). Manual is similar to Auto, but it uses a single selected letter or character (an * is the default character) to form all the letters. The latter two modes allow for faster printing and less ribbon wear.

Should you ever become lost in Shout, a Format screen will remind you of the current settings. Selecting this or any of the other options should be easy since the menu structure is the same in *Twist & Shout* as it is in *Lotus*.

Spoolproof

Apparently, Disk Spool II has no antecedents in rock-'n'-roll, and to have called the program *Twist & Shout & Disk Spool, Too* would have confused an entire generation. As the third part of *Twist & Shout*, Disk Spool is another useful utility for those of us who keep our computers busy.

Often called a *print spooler*, this kind of program allows you to use your computer during lengthy printing operations. It does this by first writing your file to a disk. Operating from behind a memory partition, the memory-resident spooler program then reads directly from the disk and sends selected files directly to your printer, allowing you to work on an entirely different operation. Disk Spool II uses the same menu system used by *Twist & Shout*. The program requires only 25K, which will leave most of us with plenty of memory for other applications.

Documentation for *Twist & Shout* consists of two manuals. One is a user's guide that explains installing, booting, directory-path creation, and so on. The other, a reference guide, gives more detailed notes on how to use the three programs and how to get the most from them. Both are well written, clear, and concise.

Overall, many business and professional computer users will benefit from the additional printer capabilities of Twist and the extra computer time provided by Disk Spooler II. Some may even benefit from Shout, though its appeal is more limited. Still, it's there, it presumably doesn't cost anything extra, and it provides a good reason for not calling the program *Twist and Spool*.

SchoolMate

Keith Ferrell

Tandy's *SchoolMate* is an ambitious product that succeeds on a sophisticated level yet falls short of meeting the needs of much of its intended audience.

Billed as an "Educational Network Solution," *SchoolMate* is designed to place teachers in control of a network of student workstations. The teacher's PC functions as a file-server and provides a variety of classroom-management and curriculum tools.

So far, so good. The program supports 3Com networks and provides drivers for TandyLink, EtherLink (including EtherLink II and Plus), and the IBM Token Ring, among others. These are wonderful systems that hold a great deal of promise for education, but I can't help but wonder how many linked sets of workstations actually exist in our schools.

Student Connection

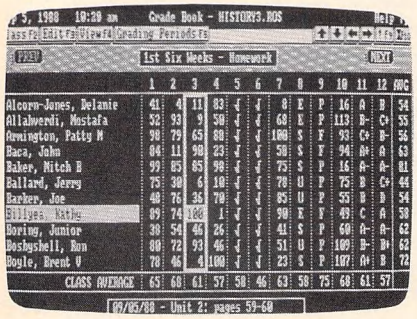
Installation on a network is straightforward but time-consuming. There are more than a dozen disks in this package, and the installation calls for a lot of swapping. Additionally, the installation procedure—which strikes me as more typical of 3Com than of Tandy—includes some questionable suggestions.

The teacher's computer should have a hard disk, which Tandy's manual suggests be wiped clean before you install *SchoolMate*. That's not really necessary. While the program does require several megabytes of storage, there's no need to reformat a working hard disk before installing the package.

It seems unlikely that a teacher who installs a 3Com network on a file-server and workstations would be wholly new to computers. Yet the installation process rewrites the AUTOEXEC.BAT pretty dramatically. (At least it copies the original AUTOEXEC to a new file.) Again, this concerns me because of the intended audience: a teacher who's accustomed to working with hard disks. Even teachers on small networks may not want a new AUTOEXEC. There should be an option or two to let you bypass this part of the installation. ▷

Book Report

The program's documentation is a mix of classic Tandy simplicity and MIS-oriented network complexity. Indeed, there are places where the documentation could learn a lesson or two from DeskMate, the progenitor of the Tandy desktop interface. The documentation and tutorial are sensibly organized, again with some exceptions. (For instance, a hard disk is required, but there's no hard disk reference in the index.)



Track grades with Tandy's SchoolMate.

The first few pages of the manual are a model of simplicity—brightly colored, clear and concise, and engaging to read. Just the sort of instructions that calm the fears of teachers and students about MS-DOS computers. It's no accident that these early pages are more concerned with the *SchoolMate* desktop than 3Com networking.

And there's the rub. While *SchoolMate*'s networking capabilities are excellent, I don't think these capabilities apply to more than a small percentage of classroom teachers. The price of the software alone limits the number of school systems that can use a networked *SchoolMate*. Even so, the program's desktop and utilities have something to offer every teacher.

Class Act

The teacher's desktop is classic *DeskMate:* a uniform interface with pull-down menus, dialog boxes, and easy control via keyboard or mouse. In short, it's an extension of one of the most effective MS-DOS environments, tailored for teachers.

SchoolMate's utilities address many of the common classroom-management needs. A roster lets the teacher track the members of each class, and a grade book tracks the students' performance. This is an especially well-realized tool, with the ability to handle weighted grade averages, multiple assignments, and other grading situations.

The exam maker is just that: a simple tool for preparing multiple-choice, essay, true/false, and other types of tests. It can also provide answer keys when appropriate. The lesson scheduler works best in a networked situation, where the teacher's assignments are distributed to the students' workstations.

Teachers lucky enough to have a network will appreciate *SchoolMate*'s option to install and run outside courseware.

Extra Credit

These are lively times in the field of educational computing. Apple's dominance of the classroom is beginning to fade, thanks in no small part to Tandy's sensible aggressiveness. Many teachers, though, still find MS-DOS too hard to use. (Which is in itself baffling: Anyone who can master *AppleWorks* and ProDOS should have little trouble with MS-DOS.)

FAST FACTS

Title:	*SchoolMate*
Category:	Classroom networking with teacher utilities
Features:	Network support; grade tracking/averaging; courseware installation and distribution
Requirements:	IBM, Tandy, or compatible PC; 640K; hard disk drive; TandyLink or EtherLink network card
Publisher:	Tandy 1500 One Tandy Center Fort Worth, TX 76102
Price:	$999.95

This is especially true with products such as *SchoolMate*. Its desktop can soothe concerns about MS-DOS while simultaneously providing an array of useful and usable tools. There's a lot here for any teacher.

But there's a lot missing, too. In tailoring the product for the education market, Tandy concentrated perhaps too much on curriculum needs and not enough on needs that are common to all computer users. While I like *SchoolMate*, I think there should be more of Tandy's old reliable *DeskMate*. The calendar, especially, should be imported wholesale into the teachers' environment. An integrated notepad or word processor would also be appreciated.

In closing, I have two caveats.

First, I didn't really review the product Tandy chose to produce. As a network package, *SchoolMate* is thorough and effective, but it's unlikely to be used in more than a few schools.

Second, I am not a teacher, although I am married to one and am friends with many more. None of them have 3Com networks or networks of any sort. But all of them loved the *SchoolMate* kernel when I showed it to them.

It's presumptuous of me to make a classroom assignment to a major hardware and software developer, but this *is* an education review. Tandy, your next project should be a self-contained, affordable *SchoolMate* desktop—one that can be used by *any* teacher with a PC. You'll receive extra credit for that one.

Once Upon a Time . . .

Bob Gingher

Compu-Teach's *Once Upon a Time . . .* is an educational program for children 6 to 12 years old that lets them create simple illustrated stories by sizing, arranging, and adding captions to a select inventory of clip art.

I had doubts, at first, as to whether this approach would actually help a child learn about narrative, vocabulary, perspective, and spatial concepts. Initially I was concerned that the simple fun of this software might short-circuit a child's creative imagination. I soon discovered, however, that children can learn a lot by writing and creating

scenes with a simple narrative.

The real question is how well *Once Upon a Time . . .* teaches. Can kids really use this program to learn about words, composition, and the art of telling a story? Now that I've tried it out for several weeks with my five- and seven-year-old boys, my answer is a considered *Yes.* This program succeeds *because* of its limitations rather than in spite of them.

Once Upon a Time . . . offers three story frames: Farm, Safari, and Main Street. Once children decide which framework they want to use, they must then decide whether to work in Book or Picture mode.

Grab a Graphic

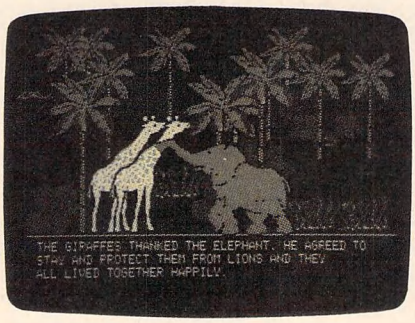
In Picture mode, the story possibilities always revolve around objects or agents of action. For Farm, the story possibilities include clip art of a barn, boy, bull, car, cat, chicken, cloud, cow, dog, farmer, fence, girl, goat, horse, house, man, moon, pig, rabbit, sheep, silo, sun, tractor, trash can, tree, truck, well, and woman. (There are 28 objects within each story's framework.)

You'll find this list on the right of the screen; you can scroll through the entire inventory with the PgUp and PgDn keys. Unfortunately, you can't combine inventories from different frames. If Main Street has a gas station and Farm has a cat, you can't use both a gas station and a cat in the same picture.

FAST FACTS

Title:	*Once Upon a Time . . .*
Category:	Children's software
Features:	Story creation with the ability to draw and manipulate pictures, write captions, and print stories in a book format
Requirements:	IBM, Tandy, or compatible PC; 256K; CGA, EGA, or VGA graphics adapter
Publisher:	Compu-Teach 78 Olive St. New Haven, CT 06511
Price:	$39.95

Press the space bar or the first letter of the option to choose DRAW, MOVE, FLIP, ERASE, WRITE, SAVE, CLEAR, PRINT, or QUIT. The DRAW option asks you which figure you want to draw. It's significant that the program doesn't let your child simply highlight the desired object. The name of the selected item must be typed in. This helps children learn how to spell the word.



A Once Upon a Time . . . *safari story.*

No Pygs Allowed

Next, hit Enter, and Ruby the Robot appears. Ruby tells you to place her where you want the pig to appear. Move Ruby with the arrow keys to the desired position, hit the Enter key again, and, presto, a pig appears. If the child misspells *pig* and types in *pyg,* Ruby responds with *Sorry, Ruby cannot draw a pyg.* Trial and error is still a superb teacher.

One neat thing about *Once Upon a Time . . .* is that you can use the + or − key to expand or shrink Ruby's size, altering the scale of the people or things within the picture. Children can use the three different sizes as a composition tool to learn about proportion and perspective. By moving and overlaying objects, you can achieve a distinct impression of perspective. (I hope a future release will allow for rotating the objects 180 degrees.)

Not only can you manipulate objects on the screen, but you can also write suitable captions for each picture. There's one thing to look out for in saving pictures: When you resave a modified version of an old picture file, its existing filename is not listed on the screen. If you confuse one picture filename with another, you might accidentally overwrite an existing picture file.

The next step is to assemble your pictures into a book. *Once Upon a Time . . .* lets you load an old book or start a new one. Should you decide to load an existing one, you can select Edit (to add, delete, or reassemble pages in your book), View (to see your book pages sequentially at two different speeds), or Print.

You can load one of the three sample books or one you've assembled yourself. You'll see a book chart, with a left column showing existing page numbers beside the picture names and a right column indicating other picture pages you've created that are not yet included in a book.

My children, Roderick and Sam, use crayons and water-base art pens to color their *Once Upon a Time . . .* story illustrations. Like junior editors, they control the composition of the pictures that appear in their little illustrated stories. They've produced some pretty wacky stories, but they've also learned a bit about conflict and drama, how to spell some new words, and what basic composition and perspective mean. We had forgotten that learning could be so much fun. After careful consideration, this family gives *Once Upon a Time . . .* a big thumbs-up.

The Duel: Test Drive II

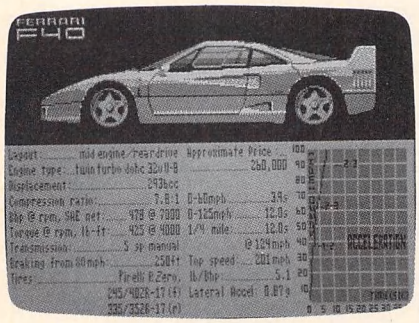
David English

Imagine you're Steve McQueen racing your car over the streets of San Francisco in the movie *Bullitt,* or Gene Hackman speeding under the elevated train in *The French Connection.* Or maybe you're Mel Gibson searching for gasoline in the desolate future of *The Road Warrior.*

You can capture a feeling of speed by renting these movies over and over again (or by losing your driver's license for going 100 miles an hour over the speed limit), but there's a better way. You can play Accolade's *The Duel: Test Drive II.* ▷

Fast and Furious

The Duel lets you cruise over 200 miles per hour with your choice of sports cars and road conditions. You use a joystick or the keyboard (unfortunately, there's no mouse support) to steer, accelerate, brake, and change gears. With the less demanding skill levels, your car is shifted automatically; the traffic is lighter; your opponent's car, the police car, and the other cars move more slowly; and you receive proportionally fewer points.



Drive at 200 mph in Test Drive II.

At the higher skill levels, it's fast and furious as you try to outrun the police (speeding tickets cost you time and points), dodge the traffic (especially with cars going both ways), and race your opponent (you select the car for your computer opponent, but after that it's every car for itself).

To prepare for your time in the fast lane, you install your own car, your opponent's car, and your scenery. *The Duel: Test Drive II* comes with two cars. You get a Ferrari F40, which would normally sell for $260,000, will do 0–60 mph in 3.9 seconds, and has a top speed of 201 mph. You also get a Porsche 959, which costs just $230,000, will do 0–60 mph in 3.9 seconds, and has a top speed of 197 mph.

The Duel also comes with three different roads that include desert straightaways (this is your best chance to outrun the police), treacherous mountains (watch out for the narrow tunnels and steep inclines), and the snakelike curves of the forest (you have to dodge the tourists, who are more concerned with seeing sights than staying up to speed).

You can also buy Accolade's extra car and scenery disks. *The SuperCars* disk ($19.95) includes five additional cars: a 1989 Corvette ZR1, a Ferrari Testarossa, a 1988 Lamborghini Countach 5000S, a 1988 Lotus Turbo Esprit, and a Porsche 911 RUF Twin Turbo. The *California Challenge* disk ($19.95) adds seven roads, including a highway with redwood trees near the Oregon border, a winding forest by the ocean on the way to Eureka, the infamous Devil's Slide near Santa Cruz, heavy traffic near San Francisco, and an L.A. freeway complete with palm trees.

To help you manage your cars and scenery, *The Duel* lets you make Play Disks. A 5¼-inch disk can hold one car or one set of scenery, while a 3½-inch disk can hold up to four cars or two sets of sceneries. The program won't warn you if you try to put too much on a Play Disk. I mistakenly put too many cars and roads on a disk but didn't realize it until the program crashed a few times looking for a file that wasn't copied. If you create a bad Play Disk, you can use the Esc key to wipe out your previous installation.

View from the Cockpit

Your view of the game is from the inside of your car looking out through the windshield. Below the windshield, you see the steering wheel (with a dot on the top to show you how much you've turned the wheel to the left or right), a tachometer (this lets you know when you're pushing the engine too much), a speedometer (in kilometers per hour for the European-made cars), and the gear shift (you can choose whether or not you see this).

Above the windshield, you see the radar detector (you have just enough time to slow down to the speed limit, or you can speed up and try to outrun the state trooper), a rearview mirror (where you'll see the trooper or your highway opponent pursuing you), and a trip meter and clock (the meter tells you how much distance remains and the clock gives the elapsed time).

The rules of the game are pretty simple. You start with five lives, but you lose a life and get a 20-second penalty if you crash, blow an engine, run out of gas, or hit too many road hazards. When you see a sign for a gas station, you need to stop between the two white lines; if you don't, you'll quickly run out of gas. Each time you make it to a gas station, you gain an extra life.

FAST FACTS

Title:	*The Duel: Test Drive II*
Category:	Sports-car simulation
Features:	Choice of cars and scenery; multiple skill levels; ability to create play disks with combinations of cars and scenery; additional cars and scenery disks available
Requirements:	IBM, Tandy, or compatible PC; 384K (CGA or Hercules) or 512K (EGA or Tandy 16-Color); DOS 2.1 or higher; joystick optional
Publisher:	Accolade 550 S. Winchester Blvd. San Jose, CA 95128
Price:	$44.95

If you're brave enough to try out the upper skill levels, you'll have to manually shift the gears. To shift gears, you use the fire button while pressing the joystick up or down. If you're using the keyboard, you can use the space bar and the up- and down-arrow keys. For a real thrill, you can press the O key for the expert mode and change gears with your joystick or keypad just as you would a real stick shift.

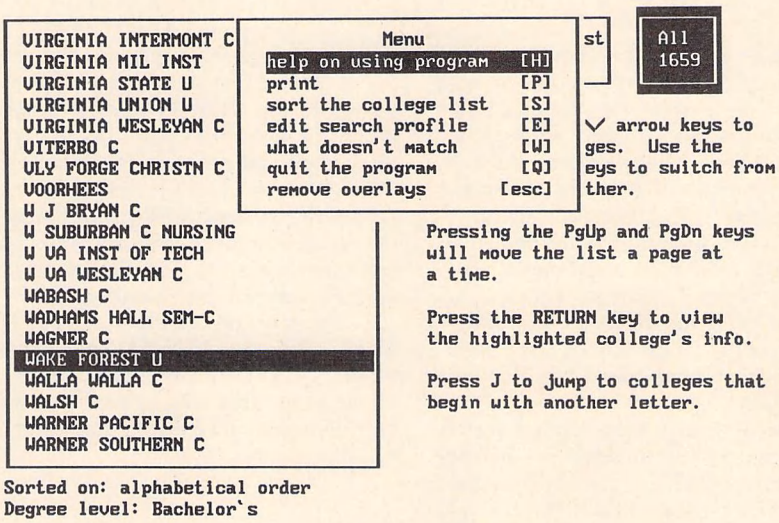
Off to the Races

As you speed down the road, watch out for the occasional rock, oil slick, loose gravel, or pothole. You should also keep an eye on the tachometer—if you *redline* (push the engine) too much, you can strip a gear. When a trooper manages to catch you by pulling in front of you, you had better slow down—if you run into the back of the police car, the game's over.

Your car handles easily at lower speeds, but it takes skill and experience to drive your simulated road rocket at 200 mph. You often have to bob in and out of the left-hand lane to pass a slower car and avoid an oncoming car. Like

a real car, your car can go out of control at high speeds and weave back and forth across the road knocking down road signs and highway markers. While the keyboard controls are more precise, I found the joystick to be more intuitive (forward to accelerate, backward to brake, and left and right for direction).

Accolade's *The Duel: Test Drive II* features excellent graphics, a variety of skill levels, and a lot of exciting highway thrills. The road action is so real that you may find yourself confusing your real car with your car in *The Duel.* Just remember not to race with the police in real life. If you can't remember, you can still drive your car in *The Duel.* Like the movies, it's a place where they never take away your license for driving too fast.



Choose the right school with College Explorer.

College Explorer

Tom Netsel

Deciding on a college is one of the toughest decisions high school students ever make. They have to consider location, cost, courses of study, and a multitude of other variables before they can determine the schools that meet their needs. While finding the right school will never be easy, *College Explorer* can streamline the search and help students make an informed decision.

Students often decide on a college or university because it's convenient or affordable, or simply because that's where their friends are going; but a number of other factors should be considered before a decision on a school is reached. Students should first take a realistic look at their own scholastic achievements, academic goals, and personal preferences, and then they should look for a college that complements their individual needs.

When considering a school, you might want to investigate its location, majors, number of students, and cost. Another important factor is the academic background of a school's freshmen class: GPA, class rank, and SAT or ACT scores. If sports are important to you, you might want to consider which sports are available.

Most of this information is found in a school's catalog and brochures, but it may take weeks or months to request and sort through them all. Also, you might overlook many excellent schools that are unfamiliar to you.

College-Bound

This is where *College Explorer* comes in. This two-part database program from the College Board contains a wealth of information on 2800 colleges and universities that offer associate's and bachelor's degrees.

One program option lets you browse through the entire list of colleges and either read the descriptions on the screen or make printouts. A primary screen and five windows provide information about a school's size, tuition and fees, financial aid, percentage of students accepted, required SAT or ACT scores, special programs, lists of majors, student activities, advanced placement information, and much more.

A more interesting—and even fun—method for investigating schools comes through building and using your own personal search profile. *College Explorer* has 400 different features, preferences, and characteristics that can be included in a customized profile. You can mark any of the 400 items as *Absolutely Necessary, Preferred but Not Necessary,* or *Unwanted.* The program then searches through the entire list, matching the schools to your requirements.

Academic Menu

Running the menu-driven program is easy. First, indicate whether you're using a color or monochrome monitor. Then start a new profile, review an old one, or browse through the entire college list. If you decide to build a profile, choose either a bachelor's or an associate's degree.

FAST FACTS

Title:	*College Explorer*
Category:	College database
Features:	2800 colleges and universities; ability to build custom search profiles
Requirements:	IBM, Tandy, or compatible PC; 256K RAM
Publisher:	The College Board 45 Columbus Ave. New York, NY 10023
Price:	$49.95

On the first profile screen, you have the choice of public, private, religious, or secular schools. You can also select coed, men-only, or women-only institutions. If a school's size is important, choose one of the five ranges—from less than 750 students to more than 7500. You can limit your searches to individual states or any of seven geographic regions.

For parents of modest means, few words can shake a family's economic

foundation faster than a teen's uttering, "I've decided on a private, out-of-state college." Because of this, financial aid is very important to many students and their families. *College Explorer* helps by listing the types of financial aid and scholarships each institution offers.

If you're looking for a school that has tough admission requirements or one that accepts anyone who applies, you can enter these factors into your search profile. High school class rank and grade-point averages can also be considered.

The next step in building a search profile is deciding on a major. *College Explorer* lists 260 associate and bachelor majors. Each area of study has specific courses to help you narrow your selection. Select a topic such as engineering, for example, and a window opens that lists 14 specialties ranging from aerospace to nuclear engineering.

Are fraternities and sororities important to you? How about advanced placement, theater, band, or student publications? Interested in sports? More than 24 intercollegiate or intramural sports for men and women can be included. And these are just a few of the factors that can make up a profile.

Textbook Example

My daughter, Alison, will graduate from high school next year, and she has started to look for colleges that offer a degree in Russian studies. This major was marked as *Necessary* on her profile. Since students often change majors, alternatives such as International Studies and Political Science were listed as preferences. I insisted that need-based financial aid be added to the profile, and she reluctantly eliminated schools that accept men only. Since her grades are good, she decided to search for schools where more than 75 percent of the freshmen had a high school GPA of 3.0 or higher.

A search with these criteria narrowed 1659 four-year schools down to 43 schools: 6 on an A list and 37 on a B list. Colleges on the A list match all the necessities, preferences, and eliminated items, while those on the B list match the necessities but not the preferences. If you want to know why any school was excluded from either list, the answer appears at the touch of a key.

College Explorer is updated each year, and the 1989–90 version should be on the market by the time this review is published. New features in the 1989–90 version will include additional help screens, improved printing procedures, additional sorting categories, a quick-reference card, profile models, and reproducible work sheets.

If you or any member of your family is college-bound but hasn't decided where, I highly recommend *College Explorer* as the first step toward making an intelligent and informed decision.

GM-6 Plus Genius Mouse

David English

PC users are starting to discover an important fact: Everything's easier with a mouse. And mouse sales figures are bearing this out. It took Microsoft five years to sell its first 1,000,000 mice, but the company expects to sell its next 500,000 mice in just one year, and the next 500,000 in just four months.

Even staid IBM has inched its way toward official sanction of the mouse. It supplies each of its PS/2 machines with a built-in pointing device connector (though some think IBM made a serious mistake by not supplying the mouse itself as standard equipment).

One thing that has increased the mouse's popularity is the growth of graphics interfaces. Xerox first combined the mouse and graphics interface in an experimental system that was never released commercially; Apple made the combination popular with its Lisa and Macintosh computers; and Digital Research (GEM) and Microsoft (Windows and OS/2's Presentation Manager) brought the combination to the world of the PC.

Today, hundreds of PC programs either require or work more efficiently with a mouse, including Windows 286, Windows 386, DeskMate, *Word*, and almost all draw, paint, CAD, and desktop publishing programs. Many of the top-selling Macintosh programs have been or will soon be translated into a graphics-based PC environment, including *Excel, PageMaker, Illustrator, Cricket Draw, Freehand,* and *ReadySetGo.* Lotus plans to release *1-2-3* Version 3.0 with mouse support later this year.

Eeek! A Mouse!

The Genius Dyna Mouse from Kye International is one of the least expensive mice around, but it is comparable, in most respects, with the more expensive mice. With its three buttons, it can emulate the two-button Microsoft Mouse and the three-button Logitech and Mouse Systems Mouse. (Because Microsoft and IBM have decided to go with the two-button mouse, most assume it will eventually win out.) You can easily switch between the two modes by pressing a mouse button as you boot the system.

Like most mice, the Genius Mouse boasts the familiar bar-of-soap shape. (If you're looking for a sleek and aerodynamic design, you might prefer the Microsoft mouse.) The Genius Mouse moves easily with no apparent jerkiness, and its buttons operate quite smoothly. With its three strips of Teflon on the bottom plate, the mouse moves especially well on the Genius Mouse Pad, which is included in the GM-6 Plus package.

The Genius Mouse is a mechanical mouse (rather than the less common optical or opto-mechanical variety), which means that it rotates on an internal rubberlike ball. The mouse cord is six feet long. It's adequate, but not nearly as generous as IBM's nine-foot mouse cord. Like the Model-T, which customers could buy in any color as long as it was black, the Genius Mouse comes in a serial version only. If you can't spare a serial port but you do have an extra slot available, you'll have to look for a bus mouse from another company. If you can't spare an extra slot but you do have an available serial port, then the serial mouse is the one for you.

What's on the Menu?

Most mice come with some sort of menu software. The Genius Mouse has pop-up mouse menus for a variety of

popular programs including *dBase II, dBase III, dBase III+, Easy, Framework, Javelin, Lotus 1-2-3,* MS-DOS, *MultiMate, Multiplan, Professional Writer, SuperCalc 3, Symphony, Turbo Pascal, VisiCalc, PFS:Write, WordStar,* and *WordStar 2000.* Kye International is working on a menu for *WordPerfect,* which should be available by the time you read this. If you have a modem, you can easily update your mouse menus, mouse driver, and *Dr. Halo III* graphics-card drivers by calling Kye International's 24-hour BBS.

I tried three of the pop-up menus included in the package: MS-DOS, *WordStar,* and *1-2-3.* The DOS menu contains 12 frequently used DOS commands (including DIR, COPY, DELETE, RENAME, CHKDSK, CLS, PRINT, DISKCOPY) and three subdirectory commands, CHANGE, REMOVE, and MAKE.

The *WordStar* menu is much more comprehensive. The left button calls up an Edit Menu, which in turn leads to eight submenus containing most of *WordStar*'s editing commands. The center button brings up a File Menu, which contains nine file commands, including various save options, Copy File, Print File, and Read File. The right button calls up a Motion Menu, which includes Screen Up, Screen Down, Top of File, Bottom of File, and Goto Previous Place. You can also move the cursor within your text by moving the mouse up, down, or sideways—though on a PC or XT, the movement is a bit sluggish.

The *1-2-3* menu uses the left button to call up the Main Menu. From there, you can select the Lotus Menu (the Lotus command line usually called up by typing /), a Calc Menu (which includes mathematical operations such as Count, Sum, +, −, and others), and a Function Menu (with Help, Edit, Name, Recalc, and options). You can also use the mouse to move from cell to cell or through the various choices on the Lotus command line.

Pop Tarts

I did run into problems when working in a second application after using an application pop-up menu. If the second application doesn't support a mouse, the mouse still acts as though it were in the first application. In this situation, you'll find it's best not to move the mouse in any way.

If this is a problem, you could make it a habit to boot up and quickly leave a mouse-supported program before entering the second application. Apparently, mouse-based programs switch off the memory resident pop-up menus. Perhaps Kye could rewrite the menu program so it would know when it's outside the host application, or, at least, supply a program that can turn off the menus when not needed.

You can make your own pop-up menus with the Menu Maker program, which is also included with each Genius mouse. It lets you create your own menus for your favorite applications, allowing you to use the mouse to automatically select function keys (such as F1 or F2), control-key combinations (such as Ctrl-S or Alt-X), special keys (such as Esc or Home), or text-based commands (such as *1-2-3*'s @Count or @Sum).

You can define the function of each of the three mouse buttons and the direction and intensity of the mouse as it moves up, down, left, and right. You can also nest menus within menus, with virtually no limit to the number of levels. While creating a menu with Menu Maker does require some preplanning, it's flexible enough to mimic the commands of most applications. If you like the idea of creating your own menus, the Menu Maker program may represent an advantage for the Genius Mouse over the Microsoft Mouse, which offers menu-making software as an extra-cost option only.

Get Graphic

Kye's GM-6 Plus package also includes the mouse-based *Dr. Halo III* graphics and slide show program. *Dr. Halo III* supports most graphics modes, including CGA, EGA, VGA, and Hercules Monochrome, and various color options, such as 800 × 600 in 16 colors and 320 × 200 in 256 colors (with the appropriate graphics adapter).

The program has many useful features, including color swapping, palette editing, onscreen help, image rotation in 90-degree increments, a fat-bits mode for individual pixel editing, snap grids for lining up charts and graphs, image scaling to shrink or enlarge portions of the graphic, virtual page to display graphics that are too big for the screen, a Grab program for translating graphics from other programs to *Dr. Halo III* format, and a Presents program to create slide show presentations.

As a paint program, *Dr. Halo III* is average—but that's saying a lot for a program that is practically free as compared to programs that cost $75–$200. (*Dr. Halo III* is available separately for $139, but you can get it with the Genius mouse for only $99.)

Nice for the Price

For value, it's hard to beat Kye International's $99 GM-6 Plus package, with its mouse, menu-maker software, applications menu library, *Dr. Halo III* graphics program, mouse pocket, and mouse pad. With the $79 GM-ST package, you get all of the above, with the exception of *Dr. Halo III* and the mouse pad. Throw in Kye's 24-hour BBS, toll-free technical support, and a lifetime free repair service, and you have an excellent, low-cost entry to the joys of mousing. ▷

FAST FACTS

Product:	GM-6 Plus Genius Mouse
Category:	Serial Mouse
Features:	Pop-up menus for many popular applications; software to make your own application menus; *Dr. Halo III* paint program; mouse pocket; mouse pad; 24-hour BBS; toll-free technical support; lifetime free repairing service
Requirements:	IBM, Tandy, or compatible PC; 384K; DOS 2.1 or higher; two drives required for *Dr. Halo III;* serial port
Manufacturer:	Kye International 12675 Colony St. Chino, CA 91710
Price:	$99.95

Name Tag Kit

Glenda McClure

Name-badge costs can really take a big chunk out of an organization's budget. For the last conference I managed, I received quotes of $1.50 each for laser-printed, three-line badges and $3.00 each for hand-lettered, two-line badges. With 400 attendees, this could be *quite* expensive.

I solved my name-badge problem with *Name Tag Kit (NTK). NTK* produces typeset-quality badges and mailing labels using my Zenith PC compatible and my 24-pin Epson printer. Now I can kiss handwritten badges and expensive professional printers good-bye.

Loading *NTK* onto a hard disk is easy because the directions are so specific. *NTK* doesn't just create a subdirectory; it gives you the commands. This reduced my apprehension about starting a new package; plus, I didn't have to look through the DOS manual.

FAST FACTS

Title:	*Name Tag Kit*
Category:	Name-tag printing program
Features:	Choice of format, font, and size; ability to import from *Lotus 1-2-3* and *dBase*; toll-free technical support
Requirements:	IBM, Tandy, or compatible PC; 384K; DOS 2.0 or higher
Publisher:	Power Up! Software 2929 Campus Dr. San Mateo, CA 94403
Price:	$99.95

Before you can print name tags, you must first create or import a database. To create a database, you highlight the Create/Edit menu and press Enter. This menu lets you add names to your database by pressing F3 and entering the information in the fields labeled First Name, Last Name, Title, Company, Address 1, Address 2, City, State, and Zip. The Create/Edit screen displays all the information for the current record as you add, edit, delete, and sort your database. If several names are from the same city, you don't have to keep typing the city; the Ditto function (F4) enters the city for you. Also, *NTK* lets you choose whether to fill in all or part of the fields. For instance, if you don't plan to print your mailing labels, you won't need to type in the address fields.

You only have to enter the host information one time and the program will automatically include it on each name tag.

Hello, My Name Is . . .

Import/Export moves the name files between *Name Tag Kit* and other data-management programs such as *Lotus 1-2-3* and *dBase*—so you won't have to rekey your existing name and address lists. First, you export the file from the data-management program, and then you import the file into *NTK*. An imported file must contain only ASCII characters, common punctuation marks, carriage returns, and linefeeds.

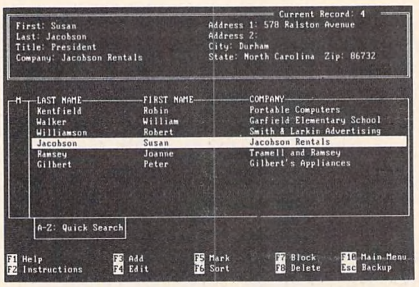
Although the manual has six pages of instructions on how to import/export, I mainly used logical deduction (if this key doesn't work, press another one). Finally, I called the toll-free support number, and a service rep explained the process to my satisfaction.

NTK offers a choice of format, font, and size. It has six ready-to-go formats, or you can create up to four customized styles. It supports eight fonts and allows mixing various fonts within the same name tag. Name tags can range in size from 2 × 2 inches to 4 × 4 inches, in 1/16-inch increments. You can set your own size or use one of three preset sizes. I had some trouble learning to maneuver the customized tag function. This section needs clearer instructions both in the manual and on the screen. I recommend that you select only one format to print your tags. It would be slow going if you tried to change the format every ten tags or so.

The F6 key sorts records by last name, first name, title, company, state, or zip. Sorting makes it easy to reprint corrected badges or to print tags by state or company.

Print That Name

You can print one name tag, an entire set, or specific ranges within a set. For convenience, you can use the F5 key to mark a block of contiguous records for deletion or printing. The Print on Screen option lets you preview the name tag on the screen in your selected format.



Name Tag Kit *is a special-purpose database.*

NTK works with the following dot-matrix and laser printers: IBM Graphics, Proprinter, and Color Printer; Epson (any model); Okidata 92 and 93 (with Plug'n Play), 182, 192, 193, 292, and 293; C. Itoh Prowriter; HP LaserJet Plus and Series II; Dataproducts 8050; NEC P3, P5, and 8023; and Toshiba P351.

How fast does *NTK* print? It took me five minutes to print 10 three-line name tags—which means it would take over four hours to print 500 name tags. The speed of the program and the number of names you can have in a file will depend on your computer's memory and disk capacity. In general, the less memory your system has and the larger your database of names, the more disk space you'll need. The worst case would be a system with only 384K of available memory and 2000 names in the database. This would require approximately 1.2MB of disk space to save the file and temporarily hold the names that couldn't be held in memory.

On the other hand, a system with 640K of memory and less than 1300 names would operate much faster because all the records could be held in memory. You would need only 360K of disk space to save the file.

Call for Help

Power Up!'s technical support deserves a special award. I know of no other software company with a toll-free technical-support phone number. My first call was after-hours, but a recorded

message urged me to leave my name and number and promised that a service rep would call back. My next call was during working hours. It was answered by a patient man who loaded *Name Tag Kit* so he could walk me through the program. While I was on hold, classical music soothed my ears. When you're paying for the phone call, you usually rush through your questions, but that isn't the case with Power Up!. The service rep says they try for a one-hour turnaround on questions when support is busy.

NTK has many other helpful features. The program warns you to be sure to exit the program *before* turning off your computer. Also, when exiting to DOS, if you haven't saved your changes, *NTK* warns you and gives you the opportunity to return to the Main menu.

On the downside, many sections of the manual are poorly written. I had to reread "Import/Export" and "Customizing Tags" many times. Also, you have to print the manual from the disk, which took me about 25 minutes. Power Up! should provide a printed manual.

Having the manual online is handy, but after you press F2 to call up the table of contents, you'll realize that there's no Go To command. I had to press Page Down 52 times to get to the "Troubleshooting" section. It would have been faster to use the printed manual.

There's another drawback: The program has some frustrating loops and inadequate screen prompts. For instance, to access a menu, you must highlight a menu item and press Enter. If you try to press the first letter of a menu item, you get a honk. Also, to Get a file, you have to exit File and access Create/Edit. There should be a note on the screen that says *Exit File and enter Create/Edit. Your records will appear in Create/Edit menu.*

Name Tag Kit creates eye-catching, attractive badges. Although it looks easy to operate, the program requires practice and more than one reading of the manual to get it to perform. But even with its shortcomings, I recommend that you buy it. It's true that you may experience problems interpreting the manual, but the solution is just a toll-free phone call away. This is one time free advice is a strong selling point.

Genghis Khan

James V. Trunzo

Genghis Khan. The very name evokes images of mounted, battle-crazed barbarians sweeping across the plains, swords and spear points gleaming in the sun, and brightly colored ribbons flying from braided horse tails. It's a name that united the fierce Mongol tribes to carve out an empire with fire and sword.

Now, thanks to *Genghis Khan,* a new simulation from Koei, you can take command of the Mongol's fearless cavalry and deadly archers and recreate history.

Genghis Khan issues orders.

Genghis Khan is actually two games in one. You can play a solitaire scenario, Mongol Conquest, or opt for the one- to four-player game, World Conquest. In the Mongol Conquest scenario, you select a persona from the various tribal chiefs, including Temujin, who later became known as Genghis Khan. Your goal is to unify the 14 Mongol tribes.

In World Conquest, your selection of an alter ego comes from a more cosmopolitan group of leaders, including Richard the Lion-Hearted, Alexius III, Genghis Khan, Phillip II of France, and Minamoto Yoritomo. Your objective in this game is to unify the entire Eurasian land mass.

Regardless of which game you choose—and logic dictates that you select Mongol Conquest first in order to learn a conqueror's tricks of the trade—*Genghis Khan* offers a stern challenge to would-be monarchs.

War and Peace

Koei's simulation is not for the timid. While the game's menu interface makes the mechanics of play seem simple, your success depends on strategy that's both subtle and complex. *Genghis Khan* is far more than just a war game, though combat and conquest make up a large part of the campaign. A good ruler must also be a diplomat, a statesman, and even a "lady's man."

Diplomacy comes into play on a number of occasions. By increasing your persuasive abilities, you can more easily form alliances. While you're still building your military strength in the early stages of the game, you'll find that talking can be more beneficial than fighting. Later, the game will test your acumen as a diplomat when you need to decide how to deal with defeated rulers and who will govern recently conquered lands.

Matters of state will also force you to consider the economic factors of ruling a nation. *Genghis Khan* makes you accountable for maintaining your empire. Your large army makes you a formidable offensive force, but it costs money to feed and arm soldiers. You can raise taxes to cover your costs, but your people can bear only so much. Watch for low morale and discontent among your people—these factors can lead to rebellion.

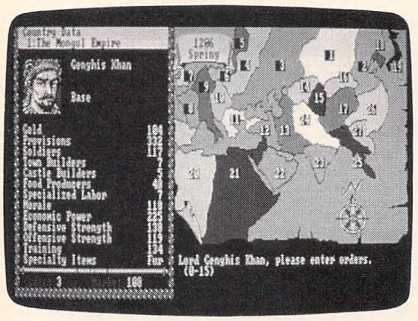
How to Woo an Empress

And what of the ladies? Every ruler needs an heir to carry on the dynasty. The Rendezvous command can help you solve this delicate problem. As Genghis Khan, you must decide the best way to win the affection of a potential empress. Will you force yourself on her, buy her affection, or express your love for her?

This romantic aspect of play is not only colorful, but it's also functional, at least when you're playing the World Conquest game. If your character dies, play can continue if you have a male heir older than 10 to inherit the throne and if an enemy's army has not invaded your character's home base.

Diplomacy, statesmanship, and domestic tranquility are minor headaches compared to the migraine that can develop from the other commands at your

disposal. Each turn represents a year and is made up of four seasons. You can issue as many as three commands per season. You might establish relations with a vassal state, trade with merchants for weapons, divide the population between food producers and fighters, train your army, engage in espionage (even sending out assassins), or go to war.



Genghis Khan wages battle.

Ah, War! Combat can take a number of forms, including ambushes and one-on-one challenges between commanders. Most fighting, however, takes place between the various components of the opposing armies. Cavalry, archery, and infantry units are placed on a hexagon-covered battlefield, where unit strength, terrain, and type of attack are factored into the outcome.

The combat in *Genghis Khan* is highly tactical, though easily implemented. Archers make long-range attacks, and mobile cavalry can shore up flanks. You can divide a single unit into multiple units or several units into one.

Good Neighbor Policy

Be careful not to become too aggressive at the beginning of the game. The computer can be a strong opponent, one capable of taking advantage of any openings. If you invade a neighboring country and fail to leave a strong defensive force, don't be surprised to see your home base attacked—unless, of course, you've been judicious enough to have established alliances with neighboring tribes.

If the number of decisions seems overwhelming, rest easy. As you gain experience, your play will improve. In addition, the manual provides you with a solid understanding of the commands, and the menu/submenu system of play helps you to keep organized and informed.

The manual, incidentally, is both a strength and a weakness. It's detailed and thorough in its explanations of how to play the game, but early versions of the manual contain many grammatical errors. Even the instructions for installing the game on a hard drive are vague. Much of the otherwise-interesting historical background is hard to understand because of the poor quality of the writing.

The shortcomings in the manual can be blamed on its too-literal translation from the Japanese manual. Koei is aware of the flaws and should have a revised manual by the time this review is published.

The graphics in *Genghis Khan* are excellent. The opening sequence is beautifully executed, and the map, caricatures, and battle icons are detailed, colorful, and easily recognized. Even the small pictures depicting natural disasters are artfully drawn, and the animated horsemen galloping off to battle are enjoyable to watch, even after repeated viewings.

Genghis Khan is a full-blown historical simulation, one that encompasses economics, politics, and intrigue, as well as warfare. Your choices directly determine your success or failure. The many details and decisions you're forced to consider make this game one of the top historical simulations on the market.

FAST FACTS

Title:	*Genghis Khan*
Category:	Historical simulation
Features:	Economic decisions, politics, intrigue, and warfare in a historical setting; two games in one; options for one to four players; excellent graphics
Requirements:	IBM, Tandy, or compatible PC; 384K; EGA or VGA graphics adapter; two 5¼-inch floppy drives or one 5¼-inch drive and a hard drive; 3½-inch disks available
Publisher:	Koei 20000 Mariner Ave. Suite 100 Torrance, CA 90503
Price:	$59.95

PC-Globe+

Lance Elko

Spend a few minutes with *PC-Globe+* and it's obvious why electronic reference works are far superior to those on paper. This package assembles a huge mass of current geographical data from 177 countries and lets you easily and quickly steer your way through it. It's an ideal reference tool for the classroom and home, as well as any business concerned with international travel or marketing.

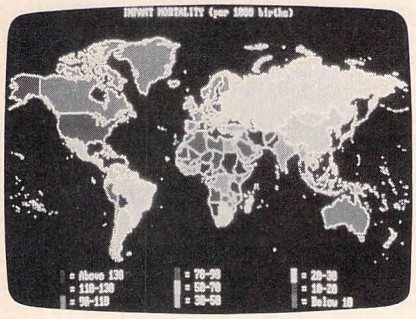
The premise of *PC-Globe+*'s design is simple: Present a world map and let the user target a continent, a region, an international group (such as NATO, OPEC, the Warsaw Pact, and the Islamic Conference), or a country. If you select a country, you can choose to find the eight major cities and eight major geographical features, and view the country's topography.

Beyond this, you can get facts and figures—presented in both text and graphs—on population, age distribution, languages, ethnic groups, religions, health statistics, city information, GNP, agricultural and industrial resources, imports and exports, government, culture, and tourism for any country selected. Dig deeper in, say, health statistics, and you can get such data as pharmacists per capita. Want to compare this number with those of other countries? Select the countries you wish to compare from the onscreen choices, and it's done. You're only a few keypresses away.

Instant Navigation

The integrated design of *PC-Globe+* is first-rate. All selections are handled via pull-down menus. The operation of the program is intuitive and simple. In fact, you can boot the program and immediately begin navigating—which is exactly

what Comwell Systems, the publisher, recommends. Within minutes after booting, I was (whimsically) comparing butter production among countries from a variety of continents. If you're ever uncertain about accessing a particular feature, you can get online help from the menu at any time.



View world statistics with PC-Globe+.

The graphics are crisp and adequately detailed. The program supports Hercules, CGA, EGA, and VGA displays. Although the designers have selected appropriate default colors and crosshatch patterns (for Hercules display) to identify the selected geographical areas, you can choose any colors or patterns you wish to use. The topographical features of the selected countries are represented by small icons—a tree shows a forest area, for example—and are labeled by numbers. The numbers correspond to a list of features along the right side of the screen.

There's a wide variety of customizable features. You can choose to see continents or regions with or without country borders. You can shift the world map display a pixel at a time (so, for example, with enough shifting, Asia is at the center of your screen instead of the default, North and South America). You can also choose for all distances to be measured in either the English or the metric system.

The Database menu selection will be, for many users, the meat and potatoes of *PC-Globe*+. Here's where you find the literacy rate, life expectancy, health statistics, population time line with projections based on current annual growth, GNP (broken into percentages for agriculture, industry, and services), tourist attractions, visa and health requirements, climate, suggested attire, and much more. Choose the Country Comparisons item from the Database menu and you can select demographic, economic, health, and commodity statistics in bar-chart form. Also from this item, you can display either the top 10 countries in each category, the top 10 plus the country you've selected, or up to 11 countries of your own choosing.

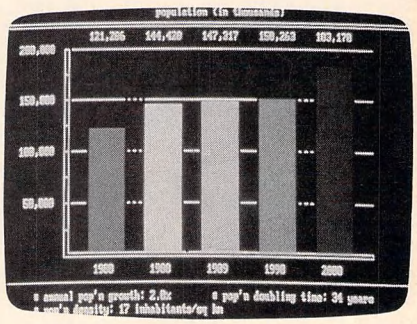
If you're not fond of bar charts, you can opt for a world map display of data in five or nine value ranges (each range has its own color corresponding to a key code). You can also choose to print out data lists, maps, or bar charts. *PC-Globe*+ supports the IBM Proprinter, the IBM color printer, and the HP LaserJet Series II (and, of course, printers compatible with any of these).

FAST FACTS

Title:	*PC-Globe*+
Category:	World geographical database
Features:	World, contintent, and country maps with geographical features; facts-and-figures database; user-selectable data comparisons
Requirements:	IBM, Tandy, or compatible PC; 384K; DOS 2.0 or higher; CGA, EGA, VGA, or Hercules graphics adapter; 5¼-inch drive (3½-inch trade-up available for $10)
Publisher:	Comwell Systems 2100 S. Rural Rd. Suite 2 Tempe, AZ 85282
Price:	$69.95

World Traveler

Choosing Utilities from the menu provides even more information. From here, you can ask for distances and bearings between any two cities or any two latitude-longitude points. You can get a currency conversion for any two countries you choose (the default rate parameter is based on the U.S. dollar). A Comwell representative noted that because these rates constantly fluctuate, you can enter the current values for a more timely reading. Also, you can find the time zones for any of the 177 countries. Save Map Display lets you save a world, continent, or region map in PCX graphics format. You can also add a caption to your screen. The final Utilities option is Recall Map Display.



PC-Globe+ *predicts population growth.*

How reliable is the mass of information in *PC-Globe*+? Most of the data is from a variety of the latest (1988) U.S. government and United Nations publications. Foreign consulates and chambers of commerce were also consulted for supplementary information. Annual update disks are available from Comwell for $30 (you get a complete new set of disks). If you don't want to wait for a full year, updated data is available at any time from Comwell for $10. A toll-free number is provided with the package.

The 28-page manual is clearly organized and written, but after a read or two, the online Help menu item is probably all you'll need. The thoughtful and logical design will make veterans of most users after a few sessions with the product.

One final note: *PC-Globe*+ comes on four 5¼-inch disks. The front of the box notes that two floppy disk drives or a hard drive are required. I had perfect success using the product on one floppy drive.

Teachers, students, parents of students, business people, and information buffs should give strong consideration to *PC-Globe*+. It's a product that clearly demonstrates why more people should own and use personal computers. ▷

Q & A 3.0

Ervin Bobo

What are the three things to look for in business software? First, the program should be so easy to use that anyone in the office can quickly learn it; second, it should be LAN-capable; and third, it must be productive.

Q & A, from Symantec, scores on all three counts, but that's only half the story. In an impressive juggling act, *Q & A* combines a full-featured word processor and a powerful database into one integrated package.

Start Write

To get started with *Q & A*, you have to choose either File or Write. Although these two modules are compatible, there's no way to go from one to the other without returning to the main menu. If you choose Write, you'll find a word processor that's similar to *PFS: Write* in both looks and performance. But *Q & A* goes a few extra steps in most of its functions.

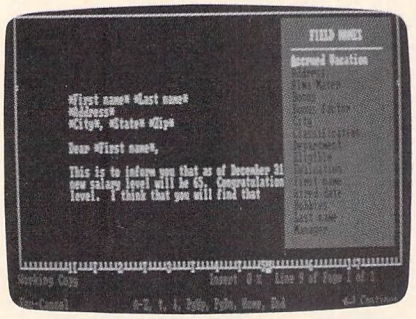
With the global menus, you can set up your screen display and printer parameters and then go to work. The working screen displays 21 lines of single-spaced text (if you require double spacing, it's done when you print). Below the text is the ruler with the tab stops marked.

Just below the ruler is a status line that tells you where you are in your document. Below that is a list of function-key options. In both the Write and File modes, F1 acts as a Help key which brings up a list of the options for whatever part of the program you're in.

Additional word processor features include a 100,000-word spelling checker, microjustification, headers and footers of up to 18 lines, date and time stamping, line drawing, and much more. One feature of the spelling checker I had not seen before is the ability to detect words accidentally typed twice in succession. You can check suspect words individually as you're working, or you can wait until you've finished and check the entire document.

Text enhancement is another nice feature, with options that include bold, underline, italic, superscript, subscript, and strikeout. Because *Q & A*'s graphics are limited to CGA, these enhancements are shown with different text colors rather than actual underlining or italics.

Q & A supports the popular dot-matrix, laser, and daisywheel printers. For some printers, you can have as many as nine fonts per document. (When you finish installing your printer, the program lets you know if your printer can't support all the features—such as extra fonts or lines drawn on the screen. This can save hours of frustration.)



Prepare form letters with Symantec's Q & A.

Q & A's word processor can work with its database for mail merge and mailing labels. You can choose Mailing Labels without having to enter Write, and then select the label's size and type from an extensive menu. A formatted template that you can edit will appear on your screen. You can also import spreadsheets and graphs created with *Lotus 1-2-3* and incorporate them into your document.

The program could use a few additional features such as folders to keep multiple related documents together or a built-in thesaurus (one is available as a $50 option). It would also be nice to have an outliner.

As it stands, however, *Q & A* will fill the needs of most office environments.

Report, Mr. Data

I've often said that any darned fool can create a database, but it takes a bit more work to extract coherent information from one. *Q & A* changes all that.

To create a form for your database, you type the label and a colon. The field will extend until it reaches a delimiter or the next field. (You can create as many as 2182 fields per form and store up to 16 million forms per database.) The next step is to specify the kind of information each field will hold. There are seven data types, including text, numeric, money, and date. You can also specify where items will appear on your screen—justified left, right, or center.

As a sidelight on data types, a global utilities option lets you specify how the program presents items such as time, money, and date. If you want all your dates in the form *March 17, 1989*, you can specify that in the global options. Then, no matter how a date is entered—as long as it's in some correct form—it is displayed in the form that you've requested.

While specifying the type of data, you can also choose whether fields will be key fields or indexed fields. The program allows up to 115 indexed fields for each record. An indexed field, called a Speed Search field in *Q & A*, is written to a special file and linked to the form for quicker retrieval.

In much the same vein, you can label fields as Unique. If you create a file of customers from invoices—and some of the customers have made multiple purchases—you can specify the name field as Unique so that the program will warn you when you try to enter John Doe's name a second time. If Jane Doe is also making purchases, you will want to make the address field Unique.

Should you wish to use an existing file, or if you're changing from another database to *Q & A*, there's an import utility that lets you import files from *PFS:File, IBM Filing Assistant, dBase III,* and *Lotus 1-2-3*, as well as fixed and standard ASCII files. (You can import files through either the File or the Write portion of *Q & A*.) It's an open question as to just how well this actually works. I was able to bring a *Lotus 1-2-3* file into both programs with no trouble, but an ASCII file loaded into File as garbage (it was OK in Write).

Although *Q & A* is a flat-file database, your reports can draw information from multiple secondary files, giving it almost as much power as a relational database.

With Reports, you can save as many as 100 report forms for each file, and calculations can have up to 16 derived fields. Derived fields appear only when they contain information: an Amount Due field might be derived from Debit minus Credit.

Act Naturally

It's also in the Reports section that you're likely to encounter the artificial intelligence of *Q & A*—perhaps the most significant feature of the program. Because *Q & A* makes it easy to produce a variety of sophisticated reports, you're more likely to explore the information contained in a file.

Briefly, the Intelligent Assistant reacts to commands stated in common language, with no need for math operators and the like, yet it's quite capable of producing meaningful reports.

When you begin, it's wise to teach the Assistant some new words: If you have a field labeled CITY, you'll want to enter synonyms such as *town, burg,* or any other name someone might use to refer to it. You might give a field labeled NAME or EMPLOYEE synonyms such as people, personnel, or peons. You can enter about eight synonyms for each field in your form.

Then, when you need new information quickly, you can go to the Intelligent Assistant and type *Give me a list of the people in each town in Arizona and include their salaries for 1988.*

If there are words it doesn't recognize, the Assistant will politely ask if you want to rephrase your request or teach it a new word.

Once everything is understood, the Intelligent Assistant takes a moment to digest the information and then rephrases and repeats your instructions so that there will be no misunderstanding: *Do you wish me to create a list of employees in Arizona, broken down by the city where they are employed, and include their salaries for 1988?*

Answer in the affirmative and your report quickly appears on the screen, nicely formatted, with dashed lines separating the categories of information. (These lines, by the way, will print nicely even though lines drawn in Write may not.)

Because it's easy to use, the Intelligent Assistant is likely to be your favorite part of the program.

Or the part that frustrates you the most.

FAST FACTS

Title:	*Q & A* 3.0
Category:	Integrated word processor and database
Features:	Word processor with menus; 100,000-word spelling checker; headers and footers; as many as nine fonts per document; line drawing; mail merge; mailing labels. Database with support for natural language queries; ability to import data files from popular programs; up to 100 report forms per file; up to 115 indexed fields per record. Both word processor and database feature LAN support, record locking, and password protection.
Requirements:	IBM, Tandy, or compatible PC; 512K; DOS 2.0 or higher (DOS 3.1 or higher is recommended for use with networks)
Publisher:	Symantec 10201 Torre Ave. Cupertino, CA 95014
Price:	$349

The key to using IA is in your word choice and in your remembering the synonyms. It's possible to forget, and it's entirely possible that another user on the LAN network will have a vocabulary that's different from your own. When instructing the IA, you should use as many synonyms as you can rather than stopping after one or two.

LAN Ho!

Many computer programs require LAN users to purchase a special version of the program. *Q & A* makes one version serve everybody—from the home user to the small business, including the most modern multicomputer offices.

Compatible with IBM Token Ring, Novell Netware, IBM PC Network, and other 100-percent compatible networks, *Q & A* supports record locking and password protection. An optional ($299) *Network Pack* added to *Q & A* will allow an additional three simultaneous users.

Because it occupies seven floppy disks, *Q & A* will work best when it's installed on a hard disk, where it takes up about 1.5 megabytes. You must be certain that your CONFIG.SYS file is set for at least 20 files and that you have more than two buffers open in order for the program to work. Further, it's not enough that you rewrite your CONFIG.SYS file—you must run a special *Q & A* routine so that *Q & A* will know you've done it.

Q & A's documentation is good, but it suffers from being split into multiple parts. There are books for both the word processor and the database. The information in one book will direct you to information in the other, making it necessary to keep some bookmarks on hand.

Still other information is contained in other manuals, including a slim Getting Started manual. I thought I had covered Getting Started pretty well. But when the program refused to open a file, I couldn't find what was wrong in the main manuals or the troubleshooting guide. The information was in Getting Started, which I thought I wouldn't need again.

On the positive side, the manuals are well done and include many screens from the program. I especially like the stop signs that are placed before paragraphs about operations that could damage files.

A tutorial disk provides you with a very good introduction to the program. It's one of the seven disks included in the package, but you don't need to install it on your hard disk. Those familiar with using database managers or word processors will probably want to run this disk first—in order to be properly overwhelmed by the capabilities and the workings of *Q & A.*

For the home, office, or small busi-

ness, *Q & A* offers a powerful database, a full-featured word processor, and a smooth, easy-to-use interface. My reservations about the manual aside, this is an outstanding package.

HeadStart III

Jim Fuchs

When I was first asked to review the HeadStart III, I had my doubts. After all, setting up a new computer takes a lot of time and work. I was curious about the machine, though, so I decided to go ahead with the review. I couldn't have made a better decision.

Getting a HeadStart

The HeadStart III is one of the easiest computers to set up that I've seen. It comes in three boxes: one for the system unit, one for the monitor, and one for the software manuals. Opening the system unit's box reveals a four-page pamphlet with a big red stop sign and instructions to read the pamphlet before proceeding with the installation.

Two of the pamphlet's pages contain instructions for unpacking and assembling the HeadStart III. There are 24 simple steps to follow, each accompanied by a detailed drawing. Many steps are as simple as plugging in the keyboard. These steps are so easy to follow that even a novice computer user can have the computer unpacked and assembled in about 20 minutes.

The instructions are well written, and the drawings make it clear exactly where the power, monitor, keyboard, and mouse cables plug in. In addition, the ports on the HeadStart III are all clearly labeled, so there should be no doubt about what goes where. The basic design of the HeadStart III is well thought out; the entire machine can be assembled without the use of tools. There are no screws to turn, DIP switches to flip, or cards to install. All you need to do is plug in the mouse, the monitor, and the keyboard, and you're ready to begin.

The HeadStart III comes with a fast, 32MB hard disk, which must be formatted before it can be used. This is easy, however, because the installation software automatically performs both a low- and a high-level format. After you've formatted the hard disk, the installation program copies the software from the five quad-density 3½-inch disks to the hard disk.

Great Graphics

One of the most exciting aspects of the HeadStart III is its spectacular VGA graphics. In its highest resolution, the HeadStart III is capable of displaying 16-color pictures with 800 × 600 pixels, but its 256-color 300 × 200 mode is the most visually stunning. Like the Amiga's Hold-And-Modify mode, pictures digitized in this mode approach television quality. As an added bonus, the HeadStart's video adapter is compatible with software written for MCGA, EGA, CGA, and Hercules video adapters.

You get free software with the HeadStart III.

The monitor that comes with the HeadStart III has a big, 14-inch screen. Graphics appear crisp and clear, with no smearing of colors. The monitor stand rotates and swivels, allowing comfortable viewing from any angle. The only thing missing is an antiglare screen; the lighting must be carefully adjusted for comfortable viewing.

The HeadStart III's keyboard is laid out like a PC AT keyboard but it's of higher quality. The keys have a nice tactile feedback—I was more comfortable with this keyboard than with some typewriter keyboards. The HeadStart III also comes with a three-button Logitech-compatible mouse. Personally, I prefer a one-or two-button mouse because with three buttons I have to think about which one to press.

One of the HeadStart III's most thoughtful features is its ability to boot from the 3½-inch, 5¼-inch, or hard disk drive. When the HeadStart III is booted from the hard disk or the 3½-inch drive, the 3½-inch drive is drive A, and the 5¼-inch drive is drive B. If you boot from the 5¼-inch drive, however, the 5¼-inch drive is drive A and the 3½-inch drive is drive B. This eliminates the problem of copy-protected programs that insist on being run from drive A.

There is one drawback to the HeadStart III's 3½-inch drive: It has no sensor to tell the difference between double- and quad-density disks. Quad-density 3½-inch disks have a square hole on the side that's opposite the write-protect notch. Some drives can recognize quad-density disks by sensing this hole. The HeadStart III doesn't have this ability; therefore, it can't tell the difference between double- and quad-density 3½-inch disks. I shouldn't complain too much, though—even IBM PS/2s don't have this sensor.

Three Roads to DOS

While installing the software, you're given a choice of operating environments. The first is the beginner environment. This environment puts a simple menu on the screen when you boot the computer. You use the mouse to select programs and enter commands.

The advanced environment is similar to the beginner environment, but it's a little more complex. Instead of showing a simple menu on the screen, this environment features pull-down menus with the commands and programs you can run. The advanced environment also includes *XTree*, a hard disk–management program that makes it easy to work with files. Below the menus, the left half of the screen contains a map of the hard drive's directory structure. The right half of the screen contains a list of the files in the current directory. Clicking on a subdirectory with the mouse makes it the current directory, and its files are automatically displayed on the right half of the screen.

Of course, there is a third operating environment, one which most PC users are already familiar with: DOS. If you like typing commands rather than using

the mouse, you can exit to DOS from both the beginner and advanced environments. This is my favorite environment, so I spent most of my time here and really gave the machine a workout. COMPUTE! gets a lot of feedback from people who experience compatibility problems, so I was very interested in the HeadStart III's compatibility.

The HeadStart III comes with MS-DOS version 3.3 and a BIOS from Award software. First, I ran all the standard tests for compatibility—*Flight Simulator, Lotus 1-2-3,* and so on—with no trouble. Next, I tried some programs that our readers have had trouble with. All these programs worked as well. The only program I had trouble with was one that bypassed the BIOS functions to access the screen directly. (Some programs bypass the BIOS to get faster execution speed.) All in all, the HeadStart III appears to be highly PC-compatible.

FAST FACTS

Title:	HeadStart III
Category:	AT-compatible PC
Features:	12-MHz, 80286 microprocessor; 1MB RAM; 32MB hard drive; 5¼- and 3½-inch floppy drives (you can boot from either drive); built-in VGA graphics adapter; mouse, DOS shell, TSR programs, and commercial software *(Splash!, Publish-It!, Perspective 3D Graphics, Twist & Shout, Framework II, ATI Tutor, XTree, Bookmark Plus, Computer*Ease,* and *Chessmaster 2000)* included; monitor available at extra cost ($795 for color VGA, $245 for monochrome VGA)
Manufacturer:	HeadStart Technologies 40 Cutter Mill Rd. Suite 438 Great Neck, NY 11021
Price:	$2,995

Tons of Software

The HeadStart III comes with a library of commercial software. One of these programs is *Splash!,* a VGA painting program. It includes tools for drawing lines, circles, squares, and other shapes. Other tools include an airbrush, a magnifying lens, a pattern fill, and so on. But *Splash!* is most impressive when it shows off its 256-color palette. Load one of the 256-color demonstration pictures and watch your friends turn green with envy.

The HeadStart III comes with several programs designed for the serious business user. For example, *Publish-It!* is a powerful WYSIWYG (What You See Is What You Get) desktop publishing program. It includes many built-in fonts for text and allows you to import text and artwork from other programs such as *Splash!* and *Framework II.* Its flexible page-layout capability allows you to easily move text and graphics anywhere on the page.

Many businesses use graphs and charts to liven up their spreadsheet numbers. The HeadStart III comes with *Perspective 3D Graphics,* a program that generates two- and three-dimensional graphs. *Perspective 3D Graphics* can import data from spreadsheets such as *Lotus 1-2-3* to generate pie charts, bar graphs, vertical and horizontal bar graphs, line graphs, and so on.

Framework II is an integrated package from Ashton-Tate. It includes a word processor with a spelling checker and mail merge, a spreadsheet module, a communications module, and a database-management module. Each of these is very good in its own right; together, they form a powerful integrated business environment.

Since all work and no play is boring, the HeadStart III also comes with *Chessmaster 2000.* This is one of the best chess programs around. It offers many playing levels and options, and it can show the chess board in either a flat, two-dimensional view or a simulated three-dimensional view. Unfortunately, the game uses CGA graphics, so it's not as attractive as it should be. This is surprising because this version was written specifically for the HeadStart III. (I'm not a good chess player, so I thought I'd run *Chessmaster* on another computer and play it against the HeadStart III. But the program displayed a message that explained the program was for HeadStart computers only.)

Along with these and other high-powered programs, the HeadStart III advanced environment includes several TSR (Terminate and Stay Resident) programs. These include a notepad, a calendar and date book, a calculator, a printer-setup program, and other useful utilities.

Boot Camp

I found no major flaws in the design of the machine, but I did find a few things that are annoying. First, as mentioned earlier, when the machine boots from the hard drive, the 3½-inch—not the 5¼-inch—drive is designated as drive A. This is backwards from most machines, which means I saw a lot of *Not ready error reading drive A* messages at first. This is just a small problem, and I got used to the configuration after a while. But it's still something I would change if I could.

Also, I'm not crazy about the arrangement of the expansion slots and the location of the keyboard connector. The HeadStart stacks its slots vertically in two rows of six slots. This makes for a smaller machine, but for someone like me—who's always installing new cards—it's a real hassle. The problem with the keyboard is that it attaches to the front of the machine, which means you have to disconnect it whenever you open the machine.

On the plus side, the HeadStart III is a relatively fast computer. While it can't compare to a 20-MHz 80286 or 80386 machine, it's fast enough for the average user. Its hard drive is big enough and fast enough to satisfy even the most demanding home user. The HeadStart III's VGA graphics are outstanding, and there are many nice touches thrown in—the mouse, the ability to boot from either the 5¼- or the 3½-inch drive, an exceptional keyboard, and the thoughtful, well-written instructions. The HeadStart III has all these features plus a high degree of compatibility with the IBM PC AT. I'd definitely recommend this machine to anyone who's considering an AT-class compatible. **PC**

Fly with Chuck

Players can take to the skies with Electronic Arts' updated *Chuck Yeager's Advanced Flight Trainer* 2.0 for IBM PCs and compatibles. The new version includes over 20 new features and is packaged with an audiotape by Chuck Yeager in which he shares several of his heroic flying experiences and offers personal instructions on how players should attempt their first flight.

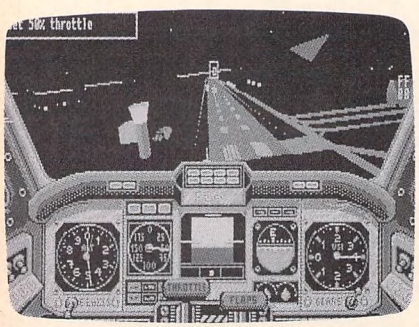
Enhancements include new terrain; EGA graphics and a full VGA analog palette; four new planes, including the Space Shuttle and the FY-117A Stealth Fighter; and six new race courses.

The game also features Yeager's Six Day Flight School, where the on-screen help system lets players advance from fundamental maneuvers to aerobatic stunts like aileron rolls and hammerhead turns. Yeager also shows players where to set the yoke, rudder, and throttle.

Advanced Flight Trainer 2.0 has a suggested retail price of $49.95. A combination pack with both 5¼- and 3½-inch disks sells for $54.95. Upgrades are available for $24.00.

Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404

Circle Reader Service Number 170.



Land at night in Advanced Flight Trainer *2.0.*

The Wizard of Sharp

The hand-held Wizard from Sharp Electronics lets you put many desktop functions into the palm of your hand. The 4 × 6 inch unit weighs eight ounces and integrates a variety of business tools, including an appointment diary, a calendar, a phone directory, a notepad, a calculator, and a world clock. A hard-wire PC linkup accessory enables users to bidirectionally load schedules, phone listings, and documents to and from a personal computer.

Sharp's Wizard is a pocket-sized computer.

The menu-driven unit has 32K of RAM memory that can be expanded to 96K with the addition of integrated circuit software cards. The phone directory stores as many as 700 names, office numbers, home numbers, fax numbers, and addresses. It can also cross-refer and sort listings. The memo function can be used as an electronic notebook and file up to 16 typed pages of information. Users can activate a security system with a choice of over 12 trillion possible passwords.

The Wizard features LCD touch-screen technology, which is used in conjunction with the software cards. The unit operates on two lithium batteries and a long-life backup battery that retains the memory for as long as two years.

A working demo card comes packaged with the Wizard and protects the touch-sensitive screen and card port from dust and dirt. The protective card enhances the command-center keypad and allows the user to access the capabilities of the seven built-in programs.

The Wizard has a suggested retail price of $299.

Separate software cards currently available for the Wizard include *Time Expense Manager* ($119.99), *Thesaurus/Dictionary* ($129.99), and *Eight-Language Translator for Travelers* ($99.99).

Sharp has also introduced the Organizer Link, which includes all necessary software and hardware to link the Wizard to an IBM PC or compatible. It has a suggested retail price of $149.99.

Sharp Electronics, Sharp Plaza, Mahwah, NJ 07430-2135

Circle Reader Service Number 171.

Taito for the PC

Taito has released two of its popular arcade games for the IBM PC and compatibles, *Renegade* and *Sky Shark*. Both games support AdLib's 11-voice and Tandy's 3-voice synthesized sound.

Based on the coin-op arcade game, *Renegade* offers players fast-paced karate action set in urban areas such as an inner-city subway platform, old shipping piers, and seedy city streets. In each situation, players fend off a gang of thugs and try to defeat the gang's leader to move on to the next level of play. Players can use the keyboard or joystick to control the action.

Sky Shark allows players to pilot a World War II–era Tiger Shark while trying to rescue prisoners of war held behind enemy lines. While flying over a vertically scrolling landscape, players encounter tanks, fortified artillery bunkers, flying bandits, and battleships. Players use firepower and bombs to destroy the enemy. The game, which is also based on a coin-op arcade hit, can be controlled by the keyboard, a joystick, or a mouse.

Both games require 512K, except with the Tandy 1000 TX and TL which require 640K for 16-color display. *Renegade* and *Sky Shark* support Hercules monochrome, CGA, EGA, VGA, and Tandy 16-color graphics. Available on 3½- and 5¼-inch disks, either game costs $34.95 for a single-disk format and $37.95 for a dual pack.

Taito Software, 267 W. Esplanade, Suite 206, North Vancouver, B.C., Canada V7M 1A5

Circle Reader Service Number 172.

Edited by Mickey McLean

PC Putter

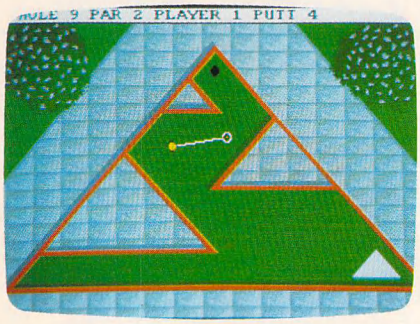
DigiTek Software has released *Hole-in-One Miniature Golf* for the IBM PC and compatibles and the IBM PS/2. The game features courses that range from traditional miniature-golf holes to bizarre tests of putting skills.

One to four players can compete on any one of five courses. The holes include a classic windmill and the interior of a pinball machine.

The game supports mouse, joystick, and keyboard controls. The package comes with either five 5¼-inch disks or two 3½-inch disks. *Hole-in-One Miniature Golf* supports EGA, CGA, VGA/MCGA, Tandy 16-color, and Hercules graphics modes. The suggested retail price is $34.95.

DigiTek Software, 8910 N. Dale Mabry, Executive Center, Suite #37, Tampa, FL 33614

Circle Reader Service Number 173.



Tee up with Hole-in-One Miniature Golf.

Digitizer Upgrade

Digital Vision has announced an upgraded version of its ComputerEyes black-and-white video digitizer system software and has released a new device driver package for developers who want to add image-capture capabilities to their applications.

ComputerEyes scans images from any standard video source such as a video camera, VCR, or videodisc. The captured images can then be displayed with the PC's standard CGA, EGA, Hercules, MCGA, or VGA graphics capabilities with no additional hardware required.

New features in version 3.1 include a high-resolution 640 × 480 image capture, support for extended VGA modes, additional file formats including more paint and desktop publishing formats, and image-enhancement routines to create smoother, sharper, or halftone images.

The complete hardware/software product retails for $249.95. Owners of older versions of ComputerEyes can receive upgrades for $15.00.

The new device driver software allows users to scan images directly into their software application. The driver package is priced at $100.

Digital Vision, 66 Eastern Ave., Dedham, MA 02026

Circle Reader Service Number 174.

Digital Vision improves its ComputerEyes.

Printing to Go

Toshiba America has introduced the portable ExpressWriter301, which provides 24-dot letter-quality printing and weighs only four pounds. The printer uses plain paper and combines 24-dot technology with a thermal-transfer process.

The ExpressWriter301 has five resident fonts and prints at 60 characters per second (cps) in high-speed mode and 42 cps in normal mode. Included with the unit are built-in rechargeable ni-cad batteries and a separate 12-volt AC adapter for recharging. The batteries can provide up to one hour of continuous printing. A low-battery indicator light is on the control panel. The printer accepts paper from 4 to 8½ inches wide. It uses a black, snap-in ribbon and has built-in paper guides.

Toshiba/Qume and Epson LQ Series emulations are standard, making the printer compatible with almost all software packages. The ExpressWriter301 comes with an optional carrying case and has a suggested retail price of $489.

Toshiba America, Information Systems Division, 9740 Irvine Blvd., Irvine, CA 92718

Circle Reader Service Number 175.

Don't Forget the ZIP Code

Melissa Data has released a new computer ZIP code database with related programs for IBM PCs and compatibles. *PC-ZIP* allows users to access up-to-date Post Office–approved ZIP, city, state, and county name for all ZIP codes currently in use in the U.S. In addition, it provides the time zone, telephone area code, and latitude/longitude for each ZIP code.

PC-ZIP comes with three associated programs that perform several data-retrieval tasks. EZIP, a name-and-address entry program, allows users to verify ZIP codes. For localized mailings, RZIP can find all ZIP codes within a radius of 1–999 miles from a specified point. The third program, QZIP, is a memory-resident program that allows users to find the area code, time zone, and county name for a ZIP or find the ZIP code of any city or town nationwide.

The main database contains over 90,000 ZIP code records. It's in *dBase III* format and can be used with custom applications. The database is updated twice a year. The suggested retail price for *PC-ZIP* is $99.

Melissa Data, 32118-8A Paseo Adelanto, San Juan Capistrano, CA 92675

Circle Reader Service Number 176.

Tandy News

Tandy has introduced the Tandy 4000 SX personal computer based on the 16-megahertz Intel 386SX microprocessor. The computer supports VGA and features SmartDrive intelligent-device-electronics (IDE) storage technology, which allows users to connect hard drives with integrated AT-type controllers directly into the system.

Users can access 8086- and 80286-based applications as well as 80386 CPU-based software that takes advantage of the 80386 architecture. The standard configuration includes one 3½-inch 1.44-megabyte floppy disk drive and three additional device slots. Other standard features include a socket for an optional 16-MHz 80387SX math coprocessor, four 16-bit expansion slots, VGA graphics, a 200-watt power supply, a 101-key enhanced keyboard with tactile feedback, keylock, an asynchronous serial port, and a bidirectional parallel port to support scanning devices in a desktop publishing environment.

One megabyte of RAM is standard. Two memory slots support up to 16MB of system memory. Users can expand the system through three front-accessible half-height device slots. Floppy disk options include 3½-inch 720K, 3½-inch 1.44MB, and 5¼-inch 1.2MB disk drives. Tandy also offers SCSI devices in capacities from 40MB to 344MB, as well as a 150MB tape drive system.

The suggested retail price of the base system without a hard drive is $2,599. The 40MB system sells for $3,248, while the 80MB system retails for $3,498.

Tandy, 1800 One Tandy Center, Fort Worth, TX 76102

Circle Reader Service Number 177.

ZSoft Brushes Up

ZSoft has introduced *PC Paintbrush IV*, which includes new image-processing features.

Seven new special effects include

blend, smudge, gradient, tiling, tint, brightness, and contrast. The program now offers precise editing of gray-scale images. *PC Paintbrush IV* also offers support for outline and bitmap fonts, plus the ability to format text and to create special text effects automatically.

Other new features include multilevel split-screen "zoom" editing, support for TIFF as well as PCX-image file formats, the ability to take full advantage of 256 onscreen colors, user-defined palette-style sheets for fast selection of desired color combinations, and an expanded toolbox.

PC Paintbrush IV requires 640K, a graphics display, and a drawing device. The suggested retail price is $99.95. Current owners of *PC Paintbrush* can receive upgrades for $35.

ZSoft, 450 Franklin Rd., Suite 100, Marietta, GA 30067

Circle Reader Service Number 178.

PC Paintbrush IV *offers 256 onscreen colors.*

Financial Manager

Brøderbund Software has released *On Balance*, a personal-finance program for the IBM PC and compatible computers. The program was previously available only on the Apple II.

The program's information screen is designed to look and work like a checkbook register. Up to 200 different accounts can be created including checking, savings, credit cards, auto loans, and mortgages. Tax-related expenditures can be flagged for recall and reporting at tax time. Each month, users can enter as many as 800 different transactions. The program can reconcile any type of account, allowing users to track their overall financial position. In addition to recordkeeping and bill paying, *On Balance* acts as a financial-planning tool, allowing users to set goals and budgets. With each entry, the program shows how close users are to meeting their goals, and it displays year-to-date totals and averages for each budget created.

The program reports net worth and net income; reminds users of recurring transactions such as car payments; creates amortization tables for loans, savings accounts, and annuities; and prints checks.

On Balance for the IBM PC also provides spreadsheet capabilities and is compatible with *Lotus 1-2-3*. The suggested retail price is $59.95.

Brøderbund Software, 17 Paul Dr., San Rafael, CA 94903-2101

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Calling All Toshiba Laptops

Computer Peripherals has extended its line of Hook-Up telecommunications packages with the introduction of two new modems designed for Toshiba laptop computers.

The Hook-Up T-24ac and Hook-Up T-24es internal modems offer 1200- and 2400-bits-per-second communications speeds and Hayes-command-set compatibility for the Toshiba Laptop models T-1100+, T-1200, T-3100, and T-5100. Features include an added eight-pin connector for acoustic-coupler operation on the Hook-Up T-24ac and an extra serial port on the Hook-Up T-24es.

Both modems come bundled with telecommunications software. The T-24ac retails for $349, while the T-24es sells for $399.

Computer Peripherals, 667 Rancho Conejo Blvd., Newbury Park, CA 91320

Circle Reader Service Number 180.

Creative Children

The Learning Company has released *The Children's Writing & Publishing Center*, a desktop publishing program designed for children ages 8–14. The program helps children create illustrated reports, stories, letters, and newsletters.

A colorful menu bar helps make the program easy for children to use. Features include a WYSIWYG (What-You-See-Is-What-You-Get) display, simple page-format choices, online help, and a sample-letter exercise.

Young users can combine words and pictures, automatically wrap words around pictures placed in documents, cut and paste text, use multiple font styles and sizes, use one- or two-column formats, and insert over 150 pictures provided with the program as well as art from many graphics libraries.

The Children's Writing & Publishing Center supports 16 colors on EGA and VGA computer systems. It also supports CGA and Hercules monochrome. You can use the program with both black-and-white or color dot-matrix printers.

The program requires at least 384K of memory, comes in both 3½- and 5¼-inch formats, and supports the Tandy DeskMate interface. The package includes a user's guide with examples of reports, stories, letters, outlines, and newsletters. The suggested retail price for the consumer edition is $69.95. A school edition specifically designed for teachers sells for $89.95.

The Learning Company, 6493 Kaiser Dr., Fremont, CA 94555

Circle Reader Service Number 181.

New HeadStart

HeadStart Technologies has introduced the HeadStart Explorer, an IBM PC–compatible computer with an operating environment that uses animated icons to show the software being used and the peripherals that are attached. The new unit also features a system of external interfaces that enable the user to add peripherals, memory capacity, and accessories without having to open the computer. The external interfaces are designed to accept custom accessories and peripherals such as a modem, a memory-expansion kit, a 5¼-inch floppy disk drive, and a proprietary 40MB hard disk cartridge.

The HeadStart Explorer comes with DOS 3.4 built-in, a word processor, a calculator, a datebook, and a file cabinet with a preconfigured address and phone book.

The computer has an 8088-1 processor that operates at both 4.77 and 9.54 MHz. The standard memory can be expanded from 512K to 768K with the external memory-expansion interface. The Explorer comes with one 720K 3½-inch floppy disk drive. Graphics support includes CGA, MCGA, MDA, and Hercules. It also features a custom 16-color CGA emulation. Serial, parallel, mouse, and game ports are also included. The Explorer comes equipped with a fold-up 84-key AT-style keyboard.

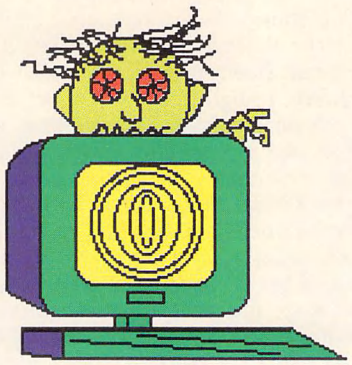
HeadStart Explorer uses animated icons.

The suggested retail price for the HeadStart Explorer without a monitor is $599.

HeadStart Technologies, 40 Cutter Mill Rd., Suite 438, Great Neck, NY 11021

Circle Reader Service Number 182. **PC**

GAME ROOM



S.O.S.

Harry Bee

Anyone can get stuck in a game. That's easy. You can't have a noble quest without a diabolical nemesis standing squarely in your way. You can't feel the desperation of imminent catastrophe without a fiendishly clever plot to untie. Set out to save the world, rescue an empire, or solve an ancient mystery, and you'll get stuck. Count on it. Getting unstuck—there's the trick.

Maybe you're like me. My brother calls me pigheaded, which isn't meant to flatter the world's porcine population. Show me a game I can't solve, and I'm inclined to continue till grapes grow at the North Pole. Foolish persistence in the face of utter hopelessness is a matter of personal honor to me. If that's you, too, I have a couple of tricks that often get me out of a sticky situation.

The first is distance. Instead of camping on the threshold of an unyielding door, drop back several moves and make another charge at the problem. Or two or three charges.

If a running start doesn't help, take a break. You're in a rut that's getting you nowhere. Sticking with it only wears the rut deeper. Put the game away for a couple of days, at least, and try something else that's impossible—like Mindscape's *Gauntlet* for one player. It's especially helpful when you stay away long enough that it becomes necessary to reread the manual.

If a recess doesn't help, the next thing I try is a completely fresh start from the beginning. It's drastic, but even if it doesn't work, you get a chance to clean up your game and get to the same place in fewer moves and in better shape. Only after I've tried all of the above do I consider raising the white flag.

Say Uncle

Wiser folks look for help sooner, I suppose, before frustration spoils the fun. But whether you look for it sooner or later, you'll find plenty. There's no reason ever to give up on a game that's fired your imagination just because you've come up against a hard place.

The first place to look for help is close to home, among family, friends, co-workers, and classmates. The best of solutions is to turn to the person at the desk behind you and ask, "OK. How do I get the Silver Bullet from the Lone Ranger?" and hear, "No problem. Tickle him with a feather from Tonto's headdress." It's rarely that simple, but it's great when it happens.

If your immediate circle of friends and acquaintances doesn't prove helpful, consider making new friends.

User groups are likely places to find people who share your interest in computers and games. Most groups aren't as freewheeling or as wide-eyed, gee-whiz enthusiastic as they were a few years ago. Today's computer clubs exist to address more practical matters than they used to. Issues like productivity, standards, and consumer protection glue today's groups together. But more often than not, you'll find a lot of experience with games as well as spreadsheets.

Naturally, you need a social inclination to benefit from user groups. You have to have the time to spend going to meetings. You should be willing to give back as much as you get from them. And you may have to look hard to find them.

Start by asking at computer stores in your area, and keep your eye on the classified notices in your local newspapers. Most groups aren't as large and as visible as the Boston Computer Society or the Capitol PC Users Group in Washington, D.C.

Who You Gonna Call?

If you're not the clubby type, or you can't make a fair commitment to a user group, you might try connecting electronically to other game players who have tastes similar to your own. A modem and a telephone are the gateway to a vast and active online community. Whether you tie into a local or private bulletin board system (BBS) or one of the large information services, such as CompuServe or GEnie, you'll always find some chatter about games and game playing.

Finding a local BBS takes the same kind of sleuthing as it takes to find a local user group. Many user groups sponsor and operate BBSs, and you don't usually have to belong to the group to join the online club. Some computer stores also run bulletin boards.

Of course, the word *local*, when it's used in *local BBS*, shouldn't be taken too literally. If you hear about a good board in Chicago, you can dial in as easily from Pittsburgh as you can from Peoria. One good way to discover bulletin boards around the country is to follow George Campbell's "Best of the Boards" column, found elsewhere in these pages. (Interstate long-distance calls are sometimes less expensive than calls within your state.)

Contrary to what you may believe, you don't have to be wealthy to subscribe to the major information services. Once you learn how to use them—primarily by learning to read and type offline—you can get a lot out of them for a small investment. The conversation about games on the large commercial boards is usually lively and always current.

CompuServe's half-dozen game forums, for instance, are among the most active on the service. I've yet to post a call for help that didn't get an answer within a day or two. And the latest addition to the game forums, the Game Publisher's Forum, lets you direct your opinions and questions directly to a game's publisher and sometimes directly to its author.

CompuServe also offers an online game player's newsletter. The Electronic Gamer, among other things, maintains an indexed database containing hints and walk-throughs for hundreds of games.

Just Passing Through

Hints, when they're done right, are gentle nudges in the right direction. They're clues to specific situations that designers or expert players know are difficult. Hints are often as puzzling as the problem you're trying to solve. At any rate, they don't directly give away the game.

Walk-throughs, on the other hand, lead you step by step from the opening

screen to the last fanfare. Both hints and walk-throughs can include maps, which can give away a lot by letting you know what to look for.

Having that kind of help at hand is awfully tempting. Even if your will is strong enough to resist the temptation, your eye often can't help but see more than you need.

The Electronic Gamer helps you resist temptation by making you select hints from a menu of game situations. And its walk-throughs are usually divided into three or more sections.

QuestBusters, a monthly print journal written *by* game players *for* game players, is another excellent source of help, particularly for adventure games and role-playing adventures. Along with news and reviews, each issue contains a complete game walk-through and dozens of hints for games both old and new. So you won't learn any more than you want to know, a simple substitution cryptogram is used to hide the most revealing information.

You can also buy hint books with collections of clues to a particular game or a series of related games. Among these, Infocom's well known Invisi-Clues hide unwanted hints by printing them in invisible ink. They also fold their maps so that you don't have to look at them.

If you ask for them, many game publishers will send you hint sheets for little more than postage. Most of them will even try to help you get past a tough spot over the phone. Some of the largest publishers maintain a dedicated support line. Small companies can't afford to be so generous, but when you call, the author of the game you're playing is as likely to answer the phone as anyone else.

Twilight Time

A few games include a clue book. One of these is Paragon Software's *Twilight's Ransom*. A text adventure on a grand scale, it has an entire city populated by a large cast of seedy characters. From the moment you find your girlfriend's apartment ransacked and your girlfriend missing, you're caught up in a desperate mystery, the solution to which is truly a matter of life and death. It's a game that comes as close to delivering the tension of a good mystery novel as I've seen in a text adventure. No whimsy here.

Not far into this story, I began to appreciate the foresight of the folks who decided to include the clues. Not that I've used them yet; it's just comforting to know they're available.

On another subject, I like very much the way *Twilight's Ransom* uses graphics. Unlike the spreading plague of trendy text adventures dressed up in superfluous art (using the term loosely), these graphics are optional. You can play the game entirely in text. Or, if you like pictures, you can turn on the slide show. It's your choice, and it's darned considerate of Paragon to give you a choice.

The Twilight Zone, from First Row Software Publishing, doesn't offer you a choice. I might forgive the pictures, which slow the game to a tedious pace, if they did anything to advance the plot—or establish one. They don't. And without them, the game is no more than an entry-level adventure, hardly challenging, and in too many places void of reason. Add poor writing, bad grammar, and several prominent misspellings, and I'm at a loss to explain what merit the keepers of Rod Serling's legacy found in this game. In Serling's vision, the realm of the possible was forever expandable, but his stories never violated the rules of reason, and he was, above all, literate.

The Twilight Zone is one of several games I've been exploring based on classic entertainment from other media. Another one from First Row, *The Honeymooners*, ranks among the lamest games I've played. Fans of both series have a right to be appalled at the sheer exploitation.

Motion Pictures

In contrast, two games from Cinemaware bring you a lot of good fun in game environments that border on the spectacular. *Rocket Ranger*, based on every Saturday matinee science-fiction serial from Commando Cody to Flash Gordon, takes you back to the 1930s, a simple time when good and evil were still clearly defined. World War II hasn't been decided yet, Hitler's Third Reich is on the rise (with help from outer space), and the planet is about to fall under the sway of the godless Nazis. Only you, Rocket Ranger, and your world-wide network of secret agents, can stop the dread march of fascism in its tracks. Gives you goosebumps, doesn't it?

The game itself is a mix of strategy episodes and arcade sequences, but it isn't hard to play. Novices are welcome. Yet the game, the graphics, the sound, and the plot combine to capture the spirit of classic Saturday-morning cliffhangers so well that this is a rousing good play no matter what level of game player you consider yourself.

There is one caveat: The advice on the game's package and in the advertising that you need a reasonably fast, AT-class computer for *Rocket Ranger* is honest.

You don't need anything special in the way of hardware for *The Three Stooges*, however. Tandy graphics or EGA add a dimension, but they aren't vital. The game is a romp. It's the most pure fun I've had playing a computer game since I wandered into a local bowling alley, some time ago, and first confronted a *Pong* machine (speaking of classics).

The premise of the game is as naive as the times that produced the Three Stooges in the first place. Moe, Larry, and Curly are out to raise money to save an orphanage, and you join them on a slapstick quest across a Monopoly-board landscape. Each space you land on brings the Stooges luck (either good or bad), tests your knowledge of Three Stooges trivia, or drops you into the middle of a classic Three Stooges comedy bit, like the pie-fight madness from *Hoi Polloi*.

What strikes me most about *Rocket Ranger* and *The Three Stooges* is their faithfulness to the flavor and texture of the original Saturday-morning movie shorts. These aren't exploitations; they're tributes. Craftsmanship isn't a term usually associated with computer games, but it does apply here. These are well-crafted efforts that demonstrate what a commitment to quality and a talented team of designers and programmers can produce: classic entertainment. **PC**

For more information on the products discussed in this column, contact the publishers at the addresses listed below.

Cinemaware
4165 Thousand Oaks Blvd.
Westlake Village, CA 91362
Rocket Ranger—$39.95
The Three Stooges—$39.95

CompuServe Information Services
500 Arlington Centre Blvd.
Columbus, OH 43220

First Row Software Publishing
900 E. 8th Ave.
King of Prussia, PA 19406
The Honeymooners—$29.95
The Twilight Zone—$29.95

GEnie
GE Info Systems
401 N. Washington St.
Rockville, MD 20850

Infocom
125 CambridgePark Dr.
Cambridge, MA 02140

Mindscape
3444 Dundee Rd.
Northbrook, IL 60062
Gauntlet—$39.95

Paragon Software
600 Rugh St.
Suite A
Greensburg, PA 15601
Twilight's Ransom—$19.95

Questbusters
P.O. Box 32698
Tucson, AZ 85751
Questbusters, 12 issues—$18.00

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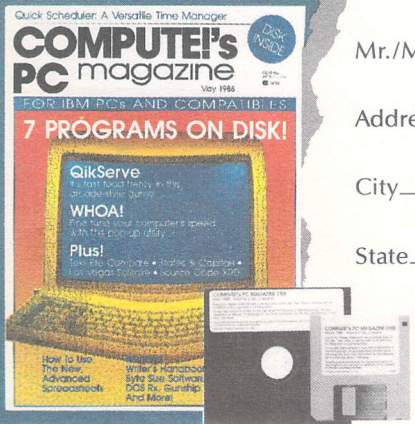

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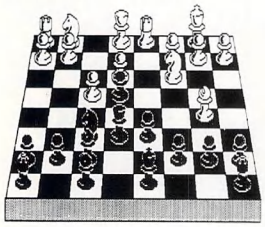

MONOPOLY (118) Great graphics.
DND (119) Similar to Dungeons and Dragons.
GLOBAL THERMAL NUCLEAR WAR (105) A game before its time
EGA RISK (GM11) World domination in terrific color. Also EGA Asteroids.
SLEUTH (117) Murder mystery similar to the board game "CLUE."
CARD GAMES (109) Includes Canasta, Hearts, Poker and Bridge.
18 HOLE MINIATURE GOLF (176) Time honored game.
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HOUSEHOLD

MEALMATE (2014) Plan your meals with this database of nutritional information.
FASTBUCKS (799) Menu-driven home finance system. Easy to utilize.
HOME INVENTORY (1966) Household inventory system. Create your own categories. Includes estate and will planning.
VIDEO TAPE LIBRARY (1998) Catalog your video tape library. Menu-driven.
RECIPES V1.0 (2011) Over 125 recipes. Adjust serving sizes from 1-99.
LITTLE BLACK BOOK (2606) Creates pocket sized address book. Prints mini-alphabetized pages.
VEHICLE MANAGEMENT SYSTEM (2013) Predicts auto repairs, tracks MPG, etc.

RELIGION

THE BIBLE (3301-3306) (6 disks) Old Testament KJV. Req. hard disk.
THE BIBLE (3307-3308) (2 disks) New Testament KJV. Req. hard disk.
THE BIBLE (3313-3324) (12 disks) Old Testament KJV. Uncompressed for PC's with floppy drives only.
THE BIBLE (3325-3328) (4 disks) New Testament KJV. Uncompressed for floppy systems.
BIBLEQ (214) Learn the Bible with this Q-A tutorial.

WORD PROCESSING

PC-WRITE V2.71 (401-402) (2 disks) Full featured word processor like the commercial versions.
MINDREADER (430) New. Uses Artificial Intelligence to complete words and phrases. Learns your style.
PC-TYPE+ (421-423) (3 disks) Jim Button's excellent W.P. Full screen editing, mail-merge, 100,000 word spelling checker, on-screen help, etc.
LETTER WRITER (405) Easy way to write letters. Popular.

BASIC

PC-PROFESSOR (1401) Basic programming tutorial.
MORE BASIC TUTORIALS (226) More lessons in Basic.

DOS UTILITIES

DOS TUTORIAL (1301) Teaches rudiments of using DOS.
DOS TIPS (1311, 1314) (2 disks) Advanced lessons in DOS.
DOS HELP (1302) Pull-down help when problems arise.
BATCH FILE TUTORIAL (1305) Learn to use and make batch files. Save much time.
STILL RIVER SHELL (1304) Run DOS commands from a menu. Makes using DOS easy.

GRAPHICS

FINGERPAINT V2.0 (1050) Paint program. Includes 6 fonts & 81 sizes. Creates graphics with mouse or keyboard.

FLOWCHARTING (1078-1079) (2 disks) Make your own flow charts. Customize own symbols, connect lines, etc.
KEYDRAW CAD SYSTEM (1001, 1002, 1065) (3 disks) Powerful CAD drawing program. Uses keyboard or mouse. Requires CGA.
SIDEWRITER (1007) Prints text sideways. Great for spreadsheets.
3-D (1003) Create and edit 3-D objects. Requires CGA.
SIM-CGA (1027) Run programs requiring CGA on your Hercules or compatible monochrome monitor.
GRASP (1031-1032) (2 disks) Create and run graphics demo programs. Uses any graphics card. Req. CGA.
LIGHTNING PRESS (2718) Printshop clone. Library of graphics for cards, letterheads, posters, newsletters, etc. Req. CGA.
CITY DESK (2513) Simple and easy to use desktop publisher.
EGA TROPICAL FISH (1087) Turn monitor into a fish tank. CGA also.

PRINTER UTILITIES

DOT MATRIX FONTS (3061-3062) (2 disks) Print out text in different fonts. Programs for IBM Proprinter, the Epson 800/1000 series, Star NX10 and NEC printers.
LASERJET FONTS/II (2721-2722) (2 disk set) Downloadable fonts for the Laserjet Plus II.
LQ V2.1 (2724) Produces high quality text on dot matrix printers.
LINCOMATIC BANNER (2714) Make banners with different fonts & sizes.

DESKTOP ACCESSORIES

HOMEBASE V2.0 (2608, 2612, 2613) (3 disks) Outshines Sidekick. PC-Magazine Editor's Choice. Many features.
PRO-MENU (3033) Run DOS and other programs from menus. Automatic custom menu maker. Make it easy on yourself.
INSTACAL (2610) Print wall-size calendar for any month or year between 1600-2200 A.D.

DATABASE

FILE EXPRESS (803-804) (2 disks) Menu-driven, easy to use and powerful. Rated excellent by PC Magazine.
PC-FILE+ V2.0 (801, 805, 837) (3 disks) Excellent. Full-featured with help screens. by Jim Button.

SPREADSHEETS

PC-CALC+ V1.0 (512-514) (3 disks) The Complete Spreadsheet program. By Jim Button.
EZ-SPREADSHEET (509) Simple and easy to use. Great for novice.
QUBECALC (508) Unique and powerful 3-D spreadsheet.
LOTUS MACROS (601) Saves much time and effort. Requires Lotus.
LOTUS TEMPLATES (602) Ready to run. Requires Lotus.
LOTUS TUTORIAL (630) Excellent. Beginning and advanced.

BUSINESS

EZ-FORMS (1908) Menu-driven forms generator.
EZ-FORMS EXEC V2.0 (2015) Contains additional features to 1908.
EASY PROJECT V1.2 (BS27) Complete project management system.
PC-GENERAL LEDGER (701) Menu-driven accounting system. Easy.
PERSONAL FINANCE MANAGER (715) Household budget manager. Keeps track of checking, savings, and investments.
MR. BILL (702-703) (2 disks) Bill customers. Create invoices, client reports, audit trail, etc.
BIDS 'N QUOTES V0.9 (BS26) Prepares cost estimates, proposals. Does labor, material, sub-contractor costs, etc.
DOCKETMINDER V1.2 (BS25) Maintain docket for lawyer or law firm.
RENTAL PROPERTY (BS24) Keeps track of rental activity. Menu driven.
BUSINESS LETTERS (BS22—BS23) (2 disks) 650 business letters to cover all your needs. Edit with any word processor.
SBAS V1.3 (797) Small business accounting system. Menu-driven.
PRO PC-ACCT V3.0 (BS28) Integrated G/L, A/R & A/P. Menu-driven, pull-down help.
SOAR V1.92 (BS20-BS21) (2 disks) Accounts receivable program. Handles variety of services or products.
CK - CHECKBOOK V3.14 (755) Full featured checkbook with reports.
PC-PAYROLL (714) Menu-driven payroll system.

EDUCATION

FUNNELS & BUCKETS (201) Great learning game. Add, subtract, multiply & divide. Ages 5-10.
LETTERFALL V1.1 (282) Improve your typing skills. Many levels.
BEGINNING SPANISH (211) Learn basic Spanish.
SPANISH II (232) Sequel.
MATHPAK (202) Tutorial with lessons in higher mathematics.
EDUCATIONAL PROGRAMS (207) For pre-school and elementary.
ERYN'S ABC'S (270) Teaches alphabet & numbers. Computerized Etch-a-Sketch. Ages 2-6. Requires Basic.
AMY'S FIRST PRIMER (248) Teaches alphabet, numbers, counting, shapes, matching, etc. Ages 4-8. Requires CGA & Basic.
THE WORLD 3D (235) Displays maps of the world. Requires CGA.

SAN MATEO EDUCATION (283) Teaches math, chemistry & geography. Ages 8-16. Requires CGA.
SPELLING BEE (284) Grades 1-12. Requires CGA & Basic.

MUSIC

PC-MUSICIAN (302) Compose music. Save and play it back.
PIANOMAN (301) Turn your keyboard into a piano!
CHRISTMAS SONGS (311) Includes many of your favorites.

COMMUNICATIONS

RBBS BULLETIN BOARD (1107-1109) (3 disks) Turn computer into a BBS. Industry standard.
Q-MODEM V3.1 (1101, 1102, 1143) (3 disks) Full featured modem program. Redialing.
PROCOMM V2.42 (1112-1113) (2 disks) Menu-driven modem program. Considered better than most commercial programs.

SECURITY/HACKING

COPY PROTECTION I (1219) Instructions for unprotecting Brownbag, dBaseIII, PCdraw, Printshop and many more.
COPY PROTECTION II (1220) Unprotect Report Writer, Clout, Castle Wolenstein, Dollars & Sense, Grafwriter and more.
COPY PROTECTION III (1221) Still more. Javelin, Sidekick, Spitfire, Symphony, Thinktank, and more.
VACCINE (1223) Various programs to protect against Virus & Trojan Horse schemes

MISC. APPLICATIONS

BIORHYTHM (1990) Calculate and print your own monthly chart.
DR. DATA LABEL (2327) Professional mailing list program. Print on postcards, envelopes, and any size label.
FAMILY HISTORY (2203-2204) (2 disk set) Creates files and genealogical reports.
STRESS & SHRINK (2006) Includes a stress test and a personality test.
LOTTO MASTER (1981) Play the lotteries with a scientific approach.
MEMBERSHIP SYSTEM (1984) Good for clubs, churches, etc.
HORSES (1999) Handicap system for thoroughbred racing.
HEALTH RISK (2010) Diagnose your ailments.
ASTROLOGY 9.5 (1916) Calculate your own chart and print out.

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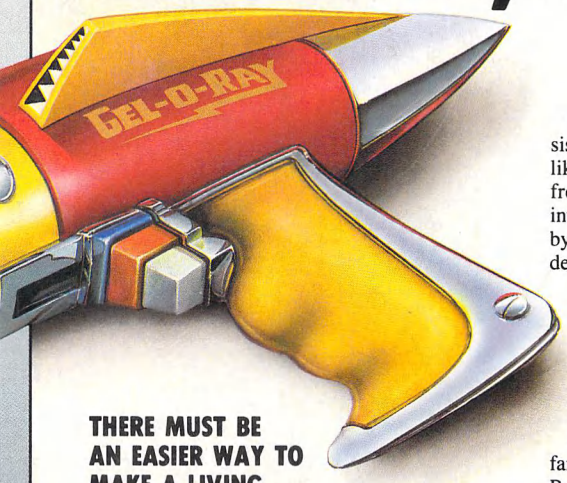
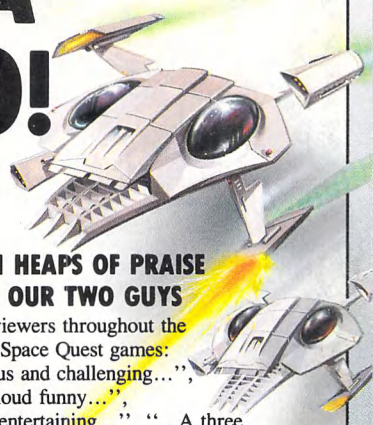
- Questbusters

YOU'RE IN DEEP PLASMA THIS TIME, ROGER WILCO!





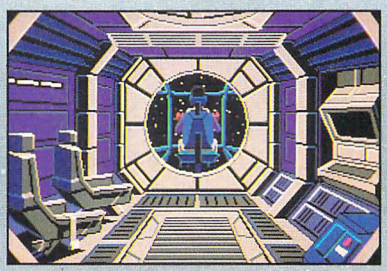
THERE MUST BE AN EASIER WAY TO MAKE A LIVING

There's never a moment's rest for galactic heroes, and when you're Roger Wilco, space-age swashbuckler and all-around nice guy, the thrills just keep on coming. It seems there's always some kind of dangerous mess to clean up.

This time it's those Two Guys from Andromeda, bestselling designers of Space Quest and Space Quest II, who have gone and gotten themselves foully abducted by the pesky pirates of Pestulon, those poaching parasites, those perverse perpetrators of petty mischief and putrid software.

If Roger can't rescue the two guys from the bowels of the Scumsoft Software stronghold, his days as a popular adventure game character are definitely numbered.

So it's simple, right? Just set course for Pestulon and storm the gates of Scumsoft.



Pilot your ship through the farthest reaches of space, using onboard computer to navigate between planets and defend yourself from enemy fighters.

NOT SO FAST, SPACEWIPE!

But the Two Guys don't write games for sissies. If you can't stomach being picked up like so much trash by a wandering garbage freighter, stalked by giant rubbish rats, ground into hamburger in the belly of the Mog, zapped by a scorpazoid in the deserts of Phleebhut, or deep-fried like a chimichanga on the planet Ortega, you'd better play one of those 'nice' games. In Space Quest III, *The Pirates of Pestulon,* you're not likely to be shown any mercy.

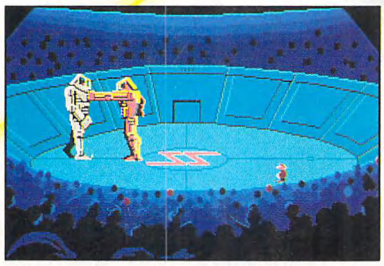
LIFE'S NOT EASY FOR HEROES

Real heroes thrive on danger, and space-faring broomjockey and freelance good-guy Roger Wilco is no exception. Is he afraid of being fried by lightning in a megathunder-storm? Is he afraid of landing in the trash shredder in the depths of the intergalactic garbage truck? Is he afraid of finishing the Belcher Combo plate at Monolith Burger? You bet your sweet asteroid!

Check out all the crazy and absurd junk, er, uh, treasures at Fester Blatz's wacky World of Wonders.

TRASH HEAPS OF PRAISE FOR OUR TWO GUYS

Game reviewers throughout the galaxy love Space Quest games: "...humorous and challenging...", "laugh-out-loud funny...", "genuinely entertaining...", "...A three dimensional graphic wonder..."



Battle for your life in the arena with the Nuke 'em- Duke 'em robots. He's down! He's up! This crowd is out for blood, and it might as well be yours.

HAVE YOU GOT WHAT IT TAKES? NOW'S YOUR CHANCE TO FIND OUT

But don't take *their* word for it -- blast off for adventure, challenge, and laughs with Roger Wilco and the Two Guys from Andromeda in Space Quest III, *The Pirates of Pestulon.*

A 3-D ANIMATED ADVENTURE GAME™

SPACE QUEST™

THE PIRATES OF PESTULON

ORIGINAL MUSIC FROM SUPERTRAMP'S BOB SIEBENBERG

Space Quest III features the best and most realistic sound of any Space Quest game. The exciting original music score and the more than two dozen realistic sound effects *must* be heard to be believed.

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